MANILA HARBOR IMPROVEMENT

VOL. 1 MANILA, P. I., MARCH, 1905 No. 10

THE FAR-EASTERN REVIEW

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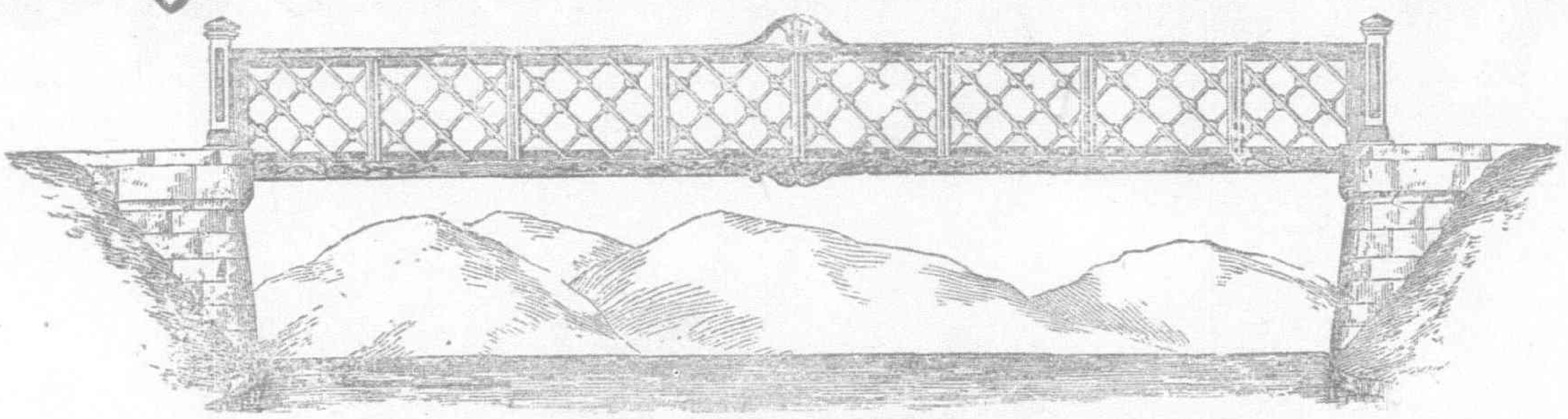

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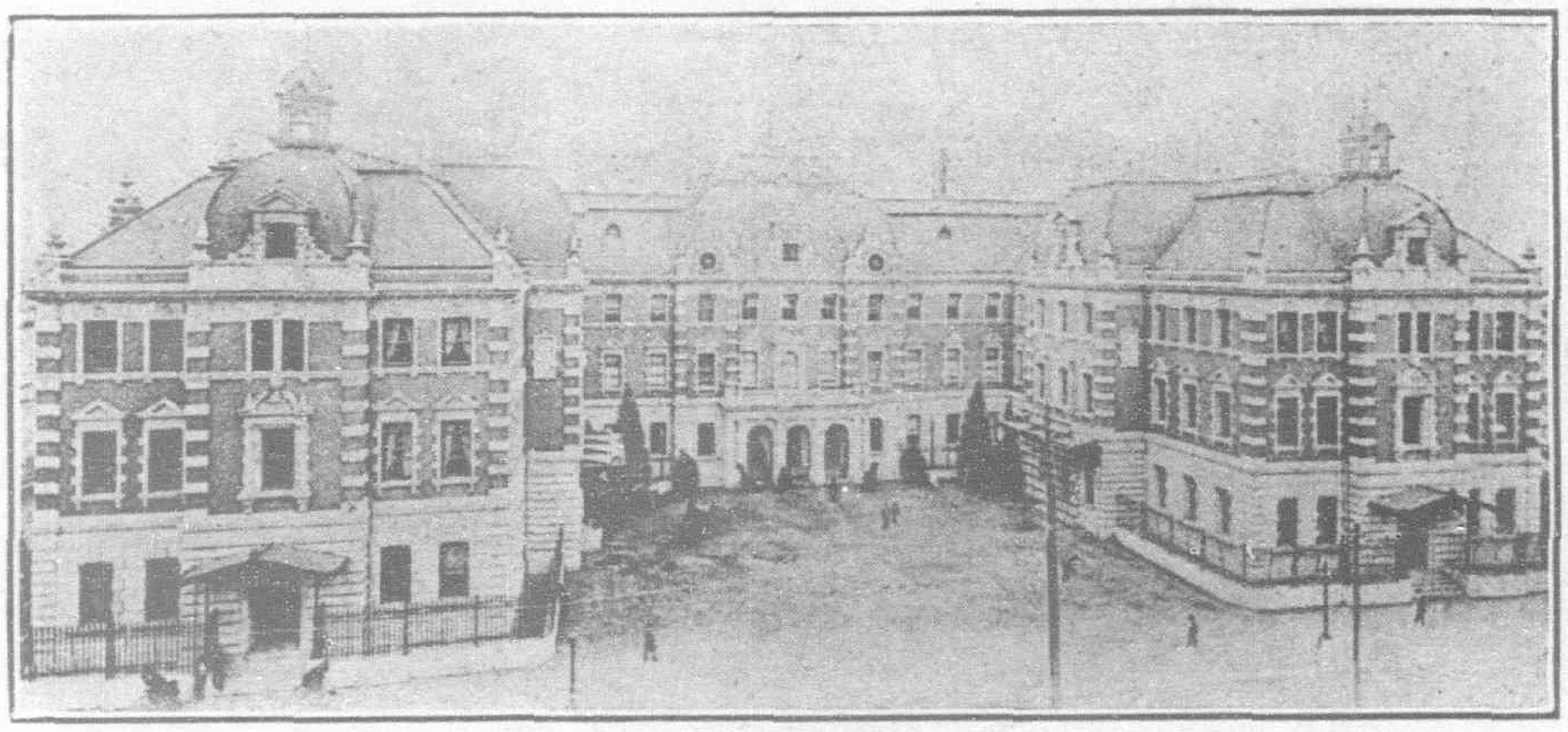

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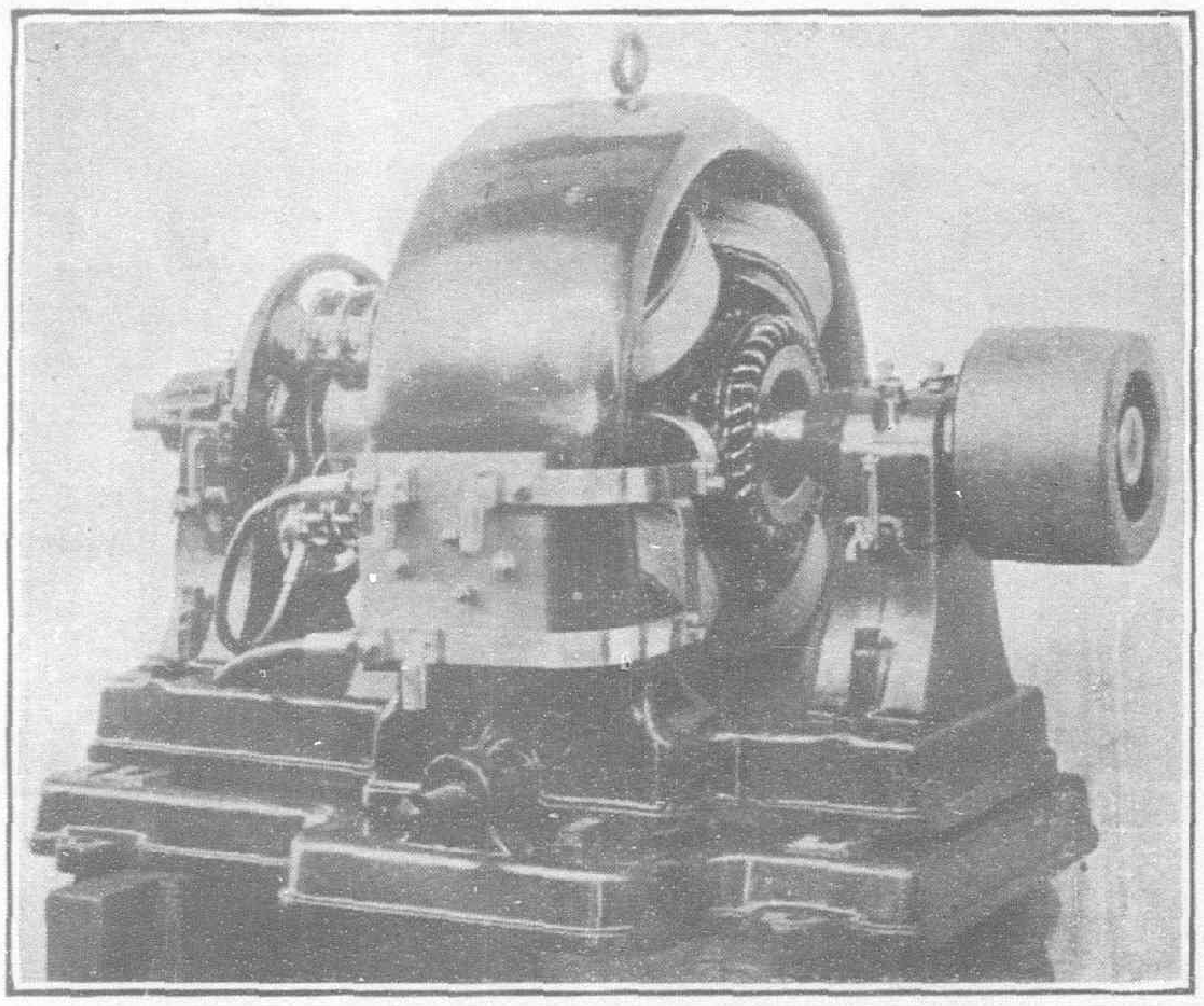

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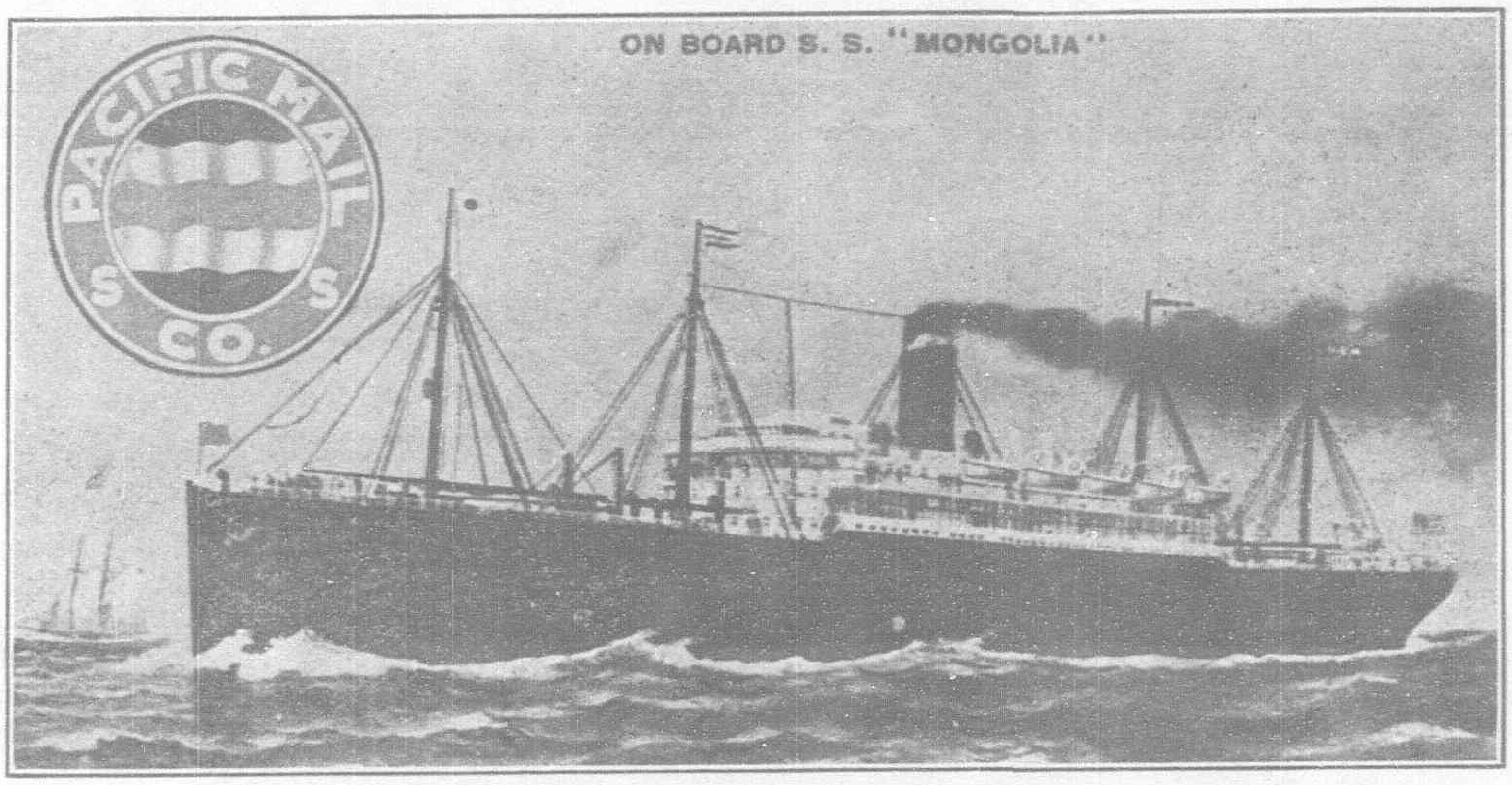

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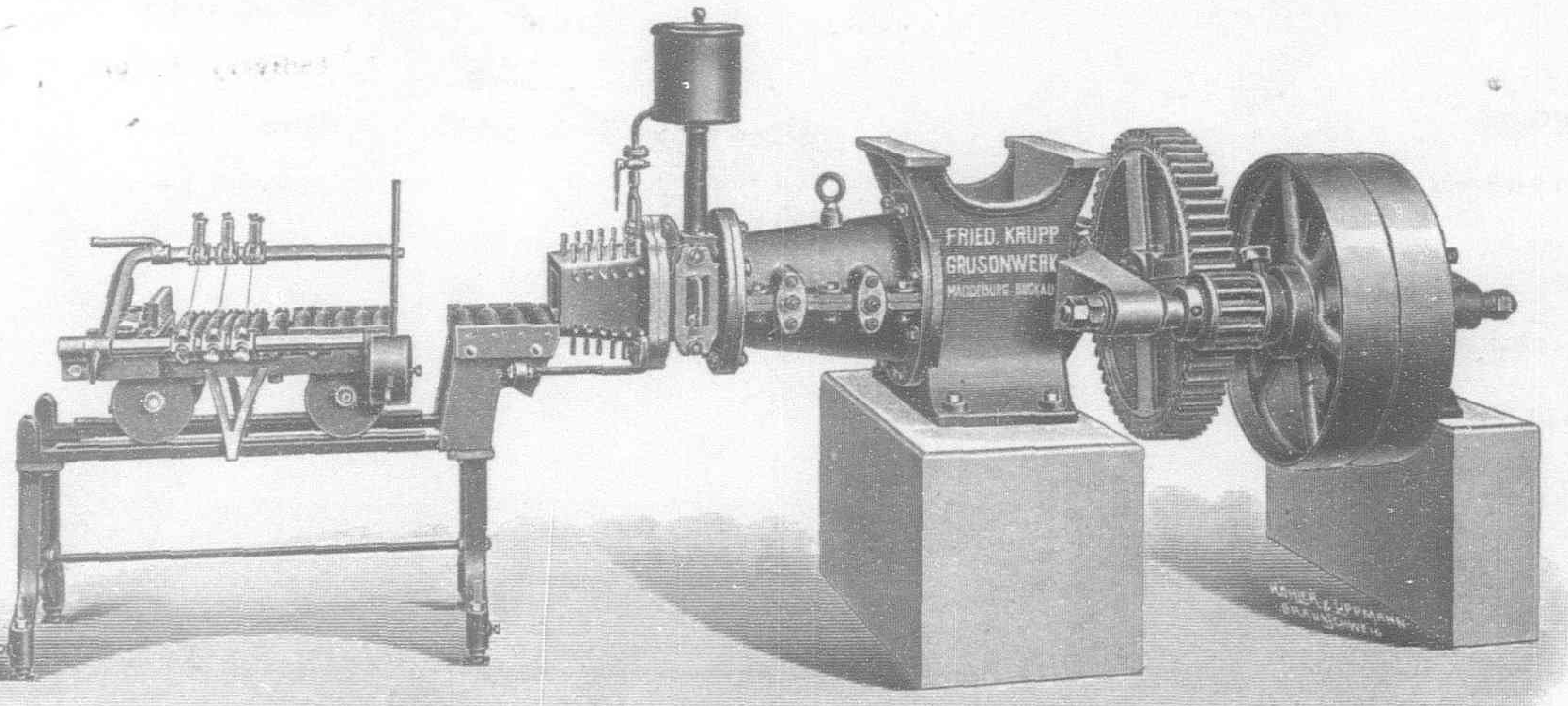

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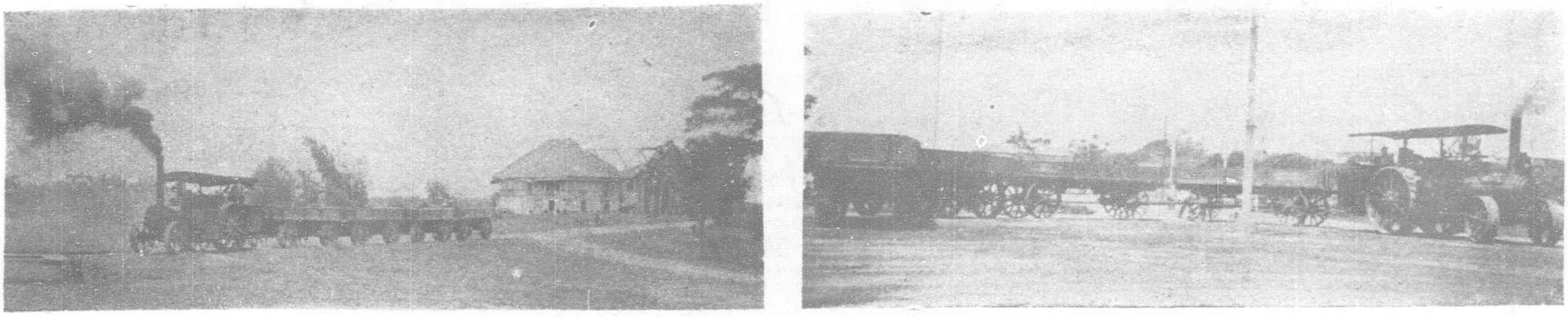

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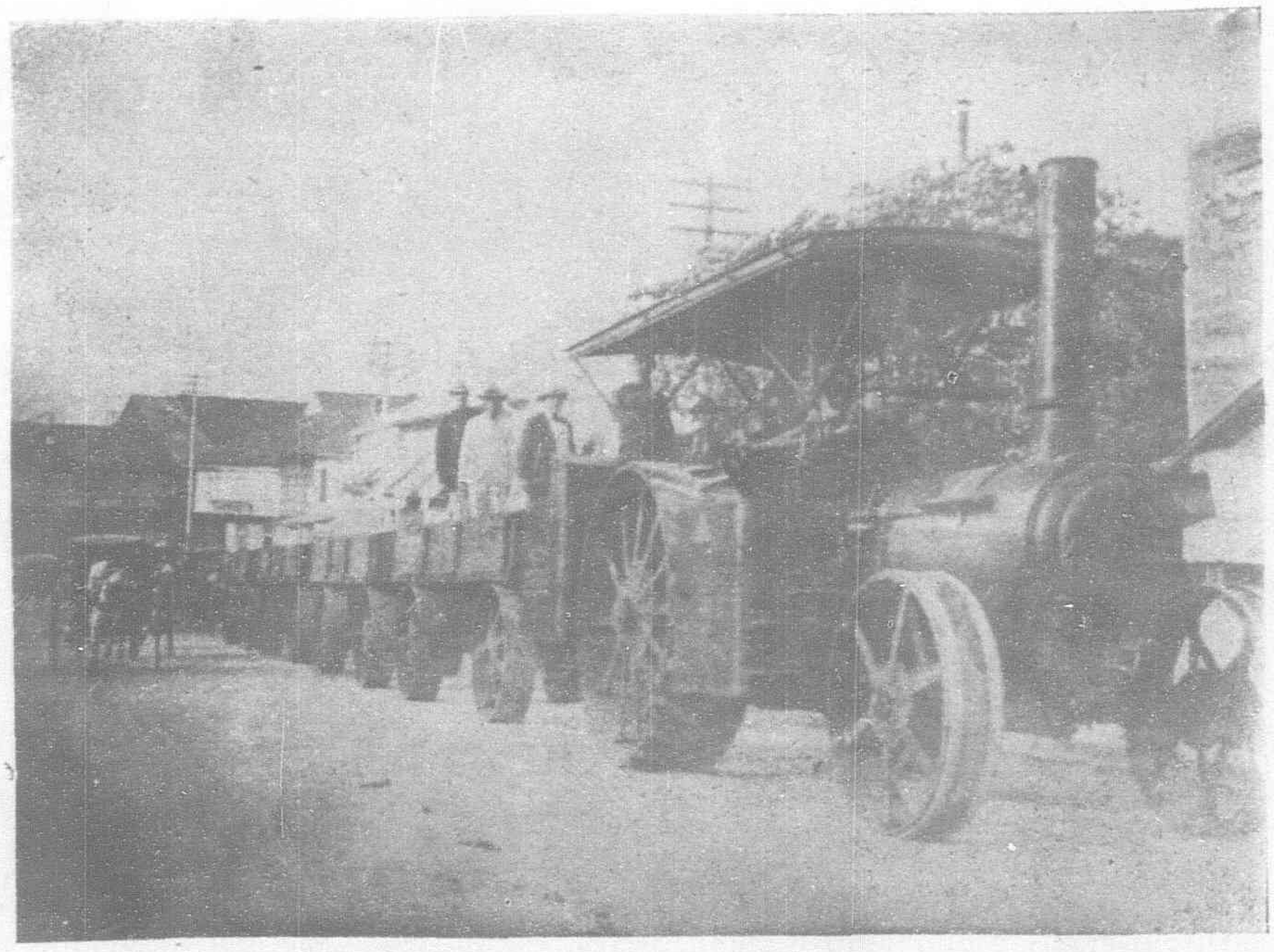

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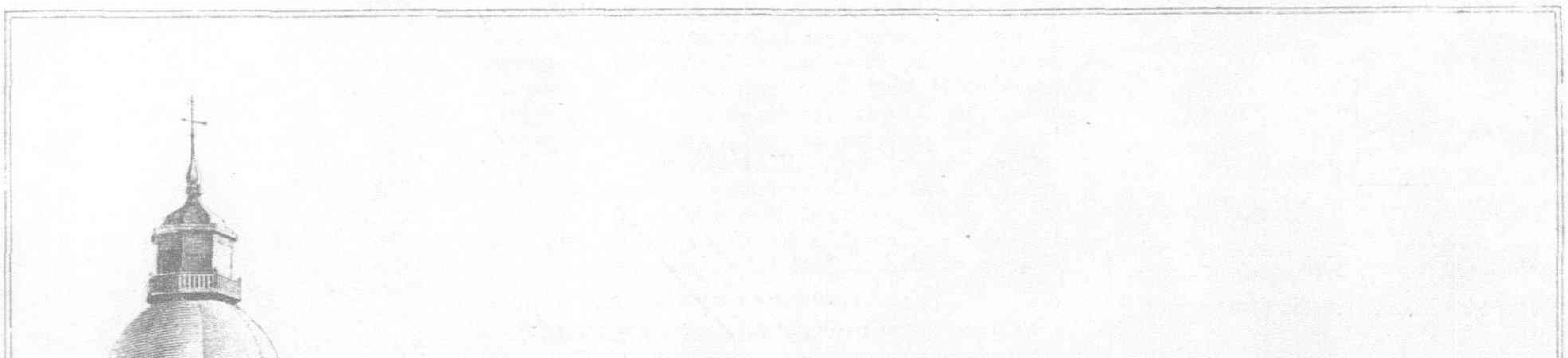

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EGYPT AND THE PHILIPPINES.

The Egypt of twenty-five years ago, says *The New York Sun*, was perhaps no great improvement on the Egypt of the days preceding its restoration by Joseph and son of Jacob. As a restorer of political and economic wrecks, Lord Cromer has quite outdone Joseph.

The last annual report of the Governor of Egypt to the British Secretary of State for the Colonies, only recently submitted, shows a $10,000,000 excess of receipts over expenditures, on a $50,000,000 revenue. It shows $80,000,000 of imports and $96,000,000 of exports. According to the *Sun* the magnitude of this industrial progress may be understood by comparison of the foregoing figures with those of 1898, when the imports were $55,000,000 and the exports a little less than $60,000,000. The railroad and river steamboat displace the camel and the *dahabeah*, and the pace of progress is measured by the change. Egypt and her recent history stand as an object lesson in the upbuilding of nations which are without power to help themselves.

And right here the *Sun* observes that upon one point at least the Cromer policy differs from that pursued by the American representatives in Cuba, Porto Rico, and the Philippines. The primary object of the Cromer policy is the establishment of a sound industrial basis, with what may be called moral progress as an incident in the work. The American policy has emphasized the feature of moral progress, notably in the matter of school establishment. Commenting on this feature of his work, Lord Cromer says in his report:

"As regards moral progress, all that can be said is that it must necessarily be slower than advance in a material direction. I hope and believe, however, that some progress is being made. In any case the machinery which will admit of progress has been created. The schoolmaster is abroad. A reign of law has taken the place of arbitrary personal power. Institutions as liberal as is possible under the circumstances have been established. In fact, every possible facility is given and every encouragement accorded for the Egyptians to advance along the path of moral improvement. More than this no government can do. It remains for the Egyptians themselves to take advantage of the opportunities of moral progress which are offered to them."

We concur in the conclusion drawn by the *Sun*, that it is unfortunate Secretary Taft's plans in this same direction regarding the Philippines should be thwarted by a Congress which thus far has disregarded his urgent and competent advice with seeming indifference to the economic welfare of the Filipinos. The United States could do much worse than follow in the footsteps of Lord Cromer. A few years of his policy would without doubt make a very material difference in the size and weight of the "white man's" burden in the Philippines.

It is opportune that Secretary Taft should bring with him to the Philippines, when he returns here the latter part of the coming summer, a party of distinguished members of the Washington Congress who have either enough interest in the welfare of the Filipinos, or sufficient curiosity to make a personal investigation into our insular conditions. We hope that when these gentlemen arrive among us they will look to the "plain people" of the Islands for whatever information they seek. It will be by mingling with the disinterested population that they will be able to gain a pretty fair knowledge of what is really needed in the Philippines to make the natives prosperous and happy. We sincerely hope the results these gentlemen may accomplish will bring about results at Washington in the matter of the favorable tariff legislation so seriously needed to better local conditions.

JAPAN'S TRADE SINCE WAR BEGAN.

The State Department at Washington recently published an interesting report from Mr. Griscom, the American Minister at Tokyo, dealing with the present economic conditions of Japan and her trade relations with the United States. Mr. Griscom in several statistical tables, compiled from official sources, compares the first nine months of the present conflict with the same time last year.

The present year shows an increase in exports of $6,424,159 and an increase in imports of $10,080,597. During the same period the increase of exports in specie and bullion amounted to $41,403,394 and the increase in imports to $1,842,370.

During the period in review exports to the United States were valued at $33,898,622 and imports therefrom at $19,719,486, showing as compared with the same period of 1903 an increase in exports of $3,919,277 and an increase in imports of $2,702,538. Raw silk was the principal item of export, showing a marked increase. There was a reduced export of tea and coal. Kerosene oil, leather, rails, flour and sugar were imported from the United States in larger quantities than during the same period last year, while raw cotton imports declined.

Mr. Griscom describes the readiness with which the Japanese Government's domestic loans have been floated. With the proceeds of the foreign loan of $48,665,000, for which the customs receipts were pledged as security by the Government, the latter repaid the money borrowed from the Bank of Japan, by which the amount of specie reserve held by the central bank was augmented and the expansion of convertible bank notes was checked.

The total amount of the national debts of Japan at the end of September stood at about $444,216,000, making a debt per capita of about $9.46.

War taxes have been increased on land, incomes, business transactions, sugar, mines, sake, bourses, customs, consumption of woolen textiles, consumption of kerosene and stamps, while a new source of considerable revenue is found in the tobacco monopoly. The official estimate of the anticipated net income to be derived from that source for the year ending March 31st, 1905, is $12,966,212 and $16,000,000 for the year ending March 31st, 1906. The Government owned railroads likewise, which are valued by the Ministry of Finance at about $95,000,000, and are estimated to bring a net income of $4,750,000 for the coming year. This item and the tobacco monopoly are assets upon which, it is generally supposed, further foreign loans will be raised. At the beginning of the war the specie reserve in the Bank of Japan fell quickly from $58,481,000 in December to $34,043,500 in May, when the first foreign loan was doubtless responsible for an increase to $58,646,000 in August, the normal condition.

Owing to the abandonment of local public works and improvements there has been a falling off in taxes officially estimated in round numbers at $10,000,000. The reports from Tokyo and Osaka clearing houses for October, 1904, show an increase of $21,157,811 in the value of bills cleared over the same month in 1903. Although other clearing houses exist in Kioto, Yokohama, Kobe, and Nagoya, Mr. Griscom believes the Tokyo and Osaka houses indicate the trend of business in the country.

The metallic currency circulation of Japan for October, 1904, shows a decrease of $2,791,630. The Japanese department of finance estimates that at the end of October, 1904, Japanese bank notes of the value of about $958,395 were circulating in Manchuria and Corea.

During the entire year 1903 postal savings banks and deposits in Japan increased $1,446,977, while during the first nine months of 1904 they increased $2,588,725.

The increase of $19,630,944 in deposits in the leading banks of Japan from January, 1903, to August, 1904, Mr. Griscom says, has been markedly free from fluctuations.

Mr. Griscom is informed by the Japanese Department of Communications that on December 31st, 1903, Japanese registered steam vessels above 20 tons numbered 1,088, with a gross tonnage of 657,269 tons. In September, 1904, they had increased to 1,193 vessels of 753,148 gross tons. During the nine months ended September 30th, 1904, there were added to Japan's mercantile fleet 146 steamers of 161,802 gross tons and there was a loss, mainly due to casualties of war, of 41 steamers of 66,034 gross tons, showing a net increase of 105 steamers of 95,768 gross tons.

The report says that the necessary abandonment during the war by several leading Japanese steamship lines of their services to foreign countries already has had considerable effect in changing the channels of trade, as for instance a large falling off in the importation of raw cotton from India, which was the principal source of Japan's supply, and which trade has gone to China.

A striking feature in the industrial history of Japan during the past year is the unusual abundance of nearly all agricultural products, and especially the unprecedented yield of rice, the yield of rice being estimated to be about 248,145,000 bushels for 1904, an increase of about 17,494,223 as compared with the yield of 1903. The average annual yield of rice since 1891 has been 199,758,794 bushels. Other cereal crops, especially barley and wheat, show considerable increase as compared with previous years. On the basis of the present market value of rice, Mr. Griscom estimates that the increased income of the country from this source will be $22,820,850 over last year.

TRADE COMPETITION!

The United States, with its 80,000,000 people and great accumulation of capital, consumes an enormous quantity of sugar, a large part of which it imports in the raw state and refines in the homeland. While it produces a considerable quantity from cane in Louisiana, and from the beet in some western and Pacific Coast states, the consumption increases more rapidly than domestic production, and the importation continues to advance. The latest summary to hand here of United States imports and exports issued by the Bureau of Statistics of the Department of Commerce and Labor at Washington, cover the eleven months of 1904 ending with November. It shows that in that period the United States imported 3,942,161,541 pounds of raw sugar, valued at $80,323,193. Of this, 2,561,597,259 pounds were shipped from Cuba, 794,669,367 from the East Indies, paying full duty, and only 37,836,788 pounds from the Philippines. The value of the Philippine export was less than $560,000. During the same period the United States exported more than this value in refined sugar, a considerable part of which went to British Africa, notwithstanding the large consumption in the homeland. Very little refined sugar was imported. The official report of the trade of the Philippine Islands for last July and the seven months ending therewith shows that our total exports for those seven months amounted to $16,643,219. Of these, $2,262,933 consisted of raw sugar, the greater part of which went to Japan, China, and Hongkong. In view of these facts and the small capacity of the Philippines for production under present industrial conditions, nothing could be more utterly pusillanimous than an objection on the part of the American sugar interests to letting into the homeland all the Islands can send there absolutely free of duty. It might affect somewhat the importation from Java and Sumatra under the duty, but it would not have the slightest effect upon trade with the West Indies and Hawaii, or upon domestic production. To speak of it as competition at all is nothing less than childish.

With tobacco the case is even more preposterous. During the year 1903 the production of tobacco in the United States was almost 816 000,000 pounds and nearly 300,000,000 pounds were manufactured into chewing and smoking tobacco and snuff. The United States makes about 7,000,000,000 domestic cigars and 3,000,000,000 cigarettes a year, and in that same year 1903 the United States exported over 364,000,000 pounds of unmanufactured tobacco, or about 47 per cent of the product. The statistics for eleven months of last year put the American exports of unmanufactured tobacco at 326.831,005 pounds, valued at $29,479,457, and the homeland also exported manufactures of tobacco to the value of $4,764,444. For the same period the United States imported of unmanufactured tobacco 27,645,488 pounds, valued at $15,073,676, of which 17,255,269 pounds entered the homeland from Cuba and 6,506,004 from the Netherlands, mostly, no doubt, the product of Sumatra. None of it came from the Philippines. Of manufactures of tobacco the homeland imported $3,440,000 in value, mostly in cigars and cigarettes from Cuba.

Now, let us see what the Philippines have been able to do in the way of exporting tobacco. Our total exports of manufactured tobacco for the seven months ending with July last were 9,158,080 pounds, valued at $458,936. More than two-thirds of it went to Spain and none went to the United States. Of cigars we exported $601,511 in value, of which a pitiful $713 is recorded as being sent to the United States. The largest quantity went to Hongkong $264,805, and the next largest, $103,538, to the British East Indies, while Great Britain took $46,387. Of cigarettes less than $8,000 worth were exported, and most of these went to the nearby market of Hongkong. Of other manufactured forms exported the value was less than $6,500, and none of that went to the United States.

In view of these facts and figures, what would be the effect upon the United States of opening the home market without obstruction to the sugar and tobacco of the Philippine Islands? It might result in the homeland taking from here some of the raw sugar which it now gets from the Dutch West Indies, but it would hardly be equivalent to its actual increase in the importation of this product from one quarter or another. That it would in the remotest degree affect domestic production in the homeland it is absurd to suppose. The United States would presumably get some Philippine tobacco leaf to add to the variety now used there in making cigars, and no doubt it would import some Manila cigars and cigarettes to meet the taste of those who like their relatively cheap smoking in that form. The quantity of tobacco imported in any form would bear a small proportion to what the United States already imports from the East and West Indies, and the proportion to domestic production and manufacture would be infinitesimal. The fear of competition from this remote and feeble quarter is wholly unwarranted, and the opposition to opening the door to it ought to excite nothing but indignant disgust in Congress and elsewhere.

But what would be the effect on the Philippines? A somewhat increased area of the Islands would be devoted to sugar and tobacco, investment of capital in the plantations, and works would be encouraged, labor would be put in the way of better employment and training to industry, trade would be benefited, and the people would be helped to advance and would feel that the Government of the United States was disposed to do something for the improvement of conditions in the Philippines. The harm to any interest in the United States would be absolutely *nil*.

MANILA ROPE TRANSMISSION

Mill experts and mechanical engineers are agreed that Manila transmission rope is an excellent medium for distributing power. Introduced but a decade ago, it has grown in favor with each succeeding year until cordage manufactures are increasing their facilities for turning ont a first class article of this important product.

Iron gearing has long been employed for power with but a single strong recommendation, viz, that of producing positive motion. Counter to this favorable consideration are several objections, principal of which are expense in installing and the extreme noise produced. Wood and rawhide have been introduced to overcome the noise, but their expense is prohibitive and results indifferent.

Belting is a favorite medium, but its first cost is large, and maintenance forms a heavy item in the repair account of each year. It, too, is not free from noise, nor is it adapted for long drives or outside exposure. Perfect alignment is a first requisite, and, where variation of power is required, more or less slipping is sure to occur, although dozens of dressings and other devices have been introduced to overcome the difficulty.

Good Manila transmission rope, properly installed, is free from any of the foregoing objections. In comparison with the old methods it can be installed at an average saving of about twenty per cent, is practically noiseless and can be carried long distances in any direction and transmit any amount of steady power. A further recommendation is that future additions can be made with short delay and small outlay. Proper installation is mentioned because this is a prime factor. Writers on this subject usually place the rope as of first importance, but ordinary Manila stock rope has been known to run for years working under favorable conditions, whereas rope of the highest excellence would be of short life with imperfect usage.

In first experiments as a transmission medium a single rope was used, several turns being taken round a drive pulley, and this one rope extended to the driver, where several more turns were made to prevent slipping. This required a large rope where much power was necessary, and the plan was abandoned for what is known as the English system of having an individual rope for every groove in the pulley. The chief objection to this system is that it requires a splice for each rope, although a counter recommendation is offered that accident occurring to one rope can be repaired without disturbance to the others. The continuous or American system has perhaps more adherents for the reasons that one splice only is required, the tension is more even, and by means of an idler pulley the slack is taken up and even tension maintained. As a matter of economy the distance and direction to be covered is practically unlimited, thus removing the necessity for additional pulleys and shafting. Remote corners and outside buildings can be reached, also upper or lower floors, damp places or exposed machinery. It will prove economy to have more grooves in pulleys and a larger rope than the estimates specify; in other words, like man or beast, a rope should not be worked to its full capacity. Liberal allowance will be wise expenditure.

In the order of their importance in the use of rope for distributing power, the following classification is suggested—Sheaves, Rope, Splicing, Care.

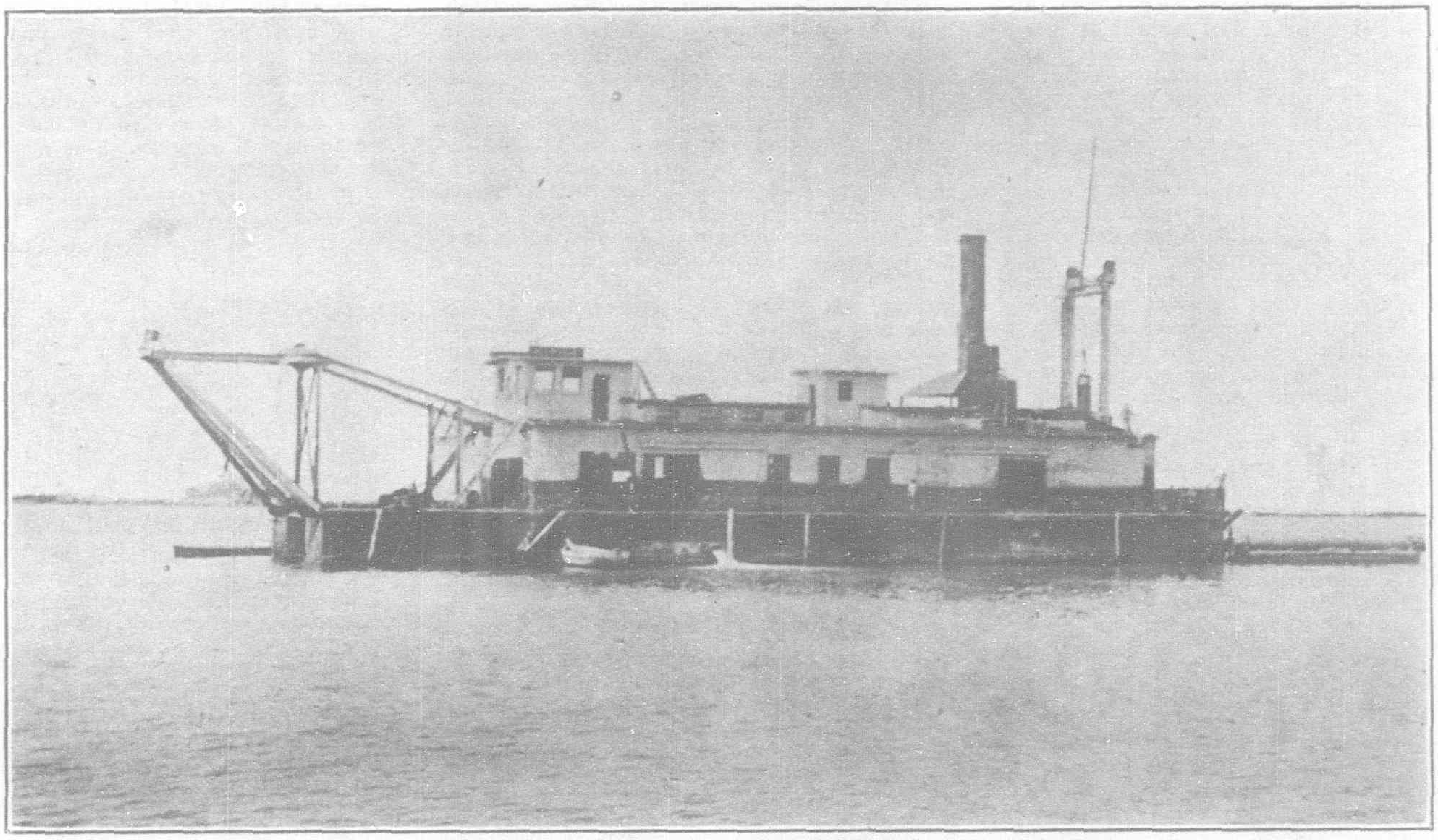
Sheaves should be as large as their use will permit. Two reasons are assigned for this. Rope bending over a large pulley will break the fiber less and give more surface for contact, thus removing further danger of slipping. Wooden sheaves are unsatisfactory. The old rule that the pulley shall be forty diameters of the rope should be the minimum. Grooves should be made "V" shaped so the rope will not quite reach the bottom, sides perfectly smooth and polished, plenty of turns and just enough weight on the take-up to keep the rope fairly taut.

The rope: Keen competition among cordage manufacturers is having the effect of producing good qualities of power rope. Superior brands of Manila hemp are selected, and even the Philippine producers are required to prepare special grades for this use. Graphite is recommended as a lubricant to be placed on the inside of rope to keep the fibers from chafing. It is questionable whether this is of much service, besides it has the objection of making the splice slip. Fish oil, vaseline, wool-grease, or any oil that will not dry out, or readily decompose and thus rot the fiber, is equally good as graphite. There is small recommendation in a four-strand rope. This form makes the rope more nearly round, thus giving more surface, but it is also more difficult to splice than the three-strand. It requires a heart for a four-strand, and as this heart is always the first to break or grind to pieces, the strands are more likely to cut into this vacant space and thus spoil the rope, whereas there is no heart nor vacancy on the inside of the three strand. Graphite should be used on rope exposed to wet or in very damp places. Having selected a good article with proper sheaves and a first-class splice, the rope with proper care will last for ten years, providing it is not worked beyond its capacity. Second-grade power ropes are to be avoided. The best will prove the most economical.

Splicing is worthy of close attention. Avoid the good old sailor. There are none of his ken living, having long since passed on to Davy Jones' locker. Mills or factories having drives of any importance will do well to have the engineer or some foreman properly instructed for this work. It is not a difficult task, but very important, and may be the means of large saving. A practical demonstration of splicing is the best method of learning, but this being inconvenient, many manufacturers have printed instructions and with directions at hand and first taking a small sized piece of common rope and following carefully, a few attempts will suffice to teach the art of splicing. The splice should be made so as not to slip and should not be larger than any other portion of the rope.

Care: No outside dressing or treatment is necessary to a transmission rope, nor is any sticky substance required to keep it from slipping, providing enough turns around the pulley are taken and proper installation made. Remove any obstructions and do not allow the rope to strike anything or rub the adjoining one.

Adherence to these first principles will be commended by those already using rope for transmission purposes, and to those contemplating its use it may prove a means of saving some costly experiments. However, repeating a former assertion, this manner of distributing power from first drive to the last driven machine is economical, satisfactory, and a long step forward in mechanical improvement.—D. R. YOUNG in *The Timberman*, Portland, Oregon.



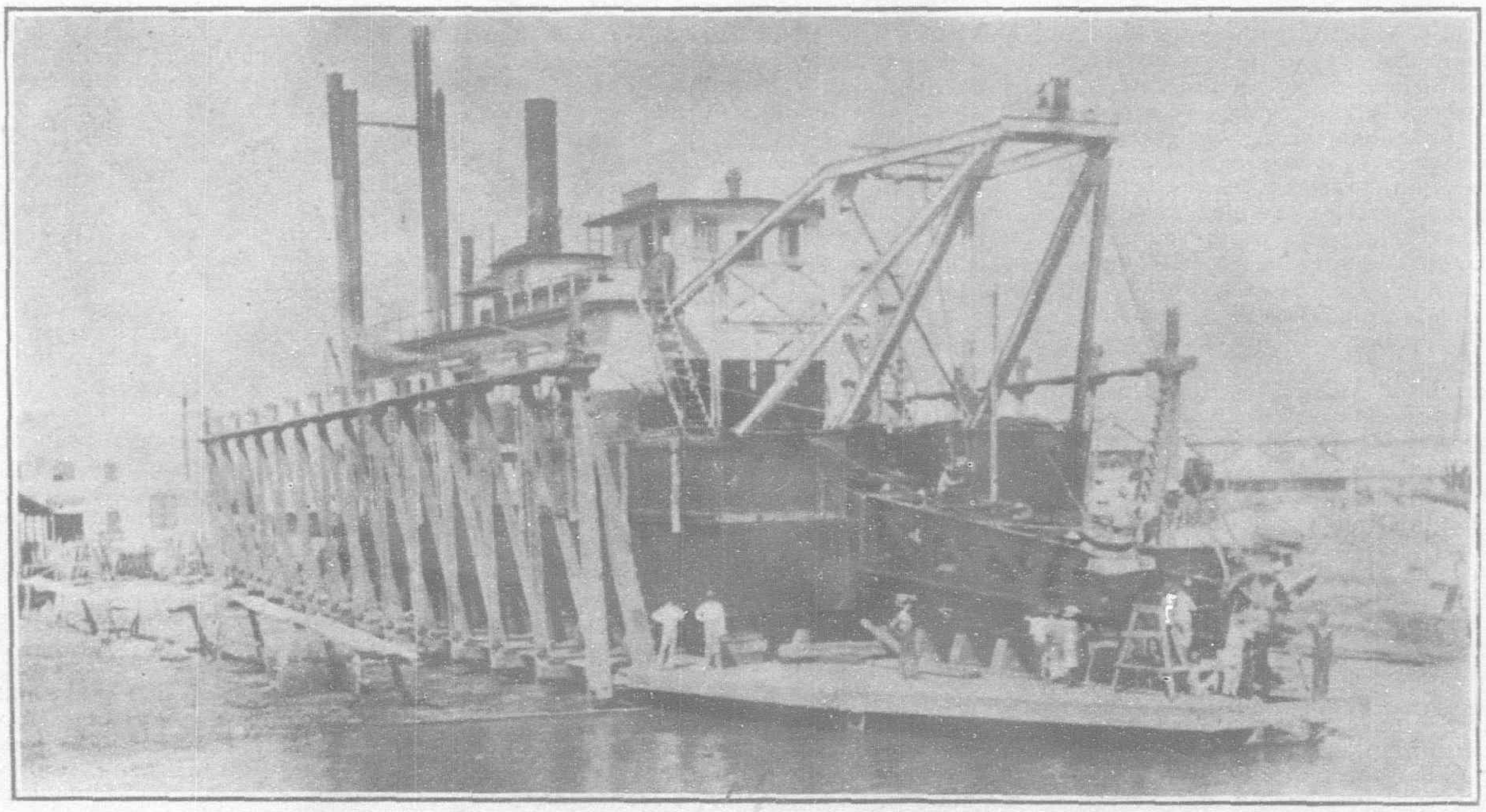
TWENTY-FOUR-INCH HYDRAULIC DREDGER "MANILA".

IMPROVEMENT OF THE HARBOR OF MANILA

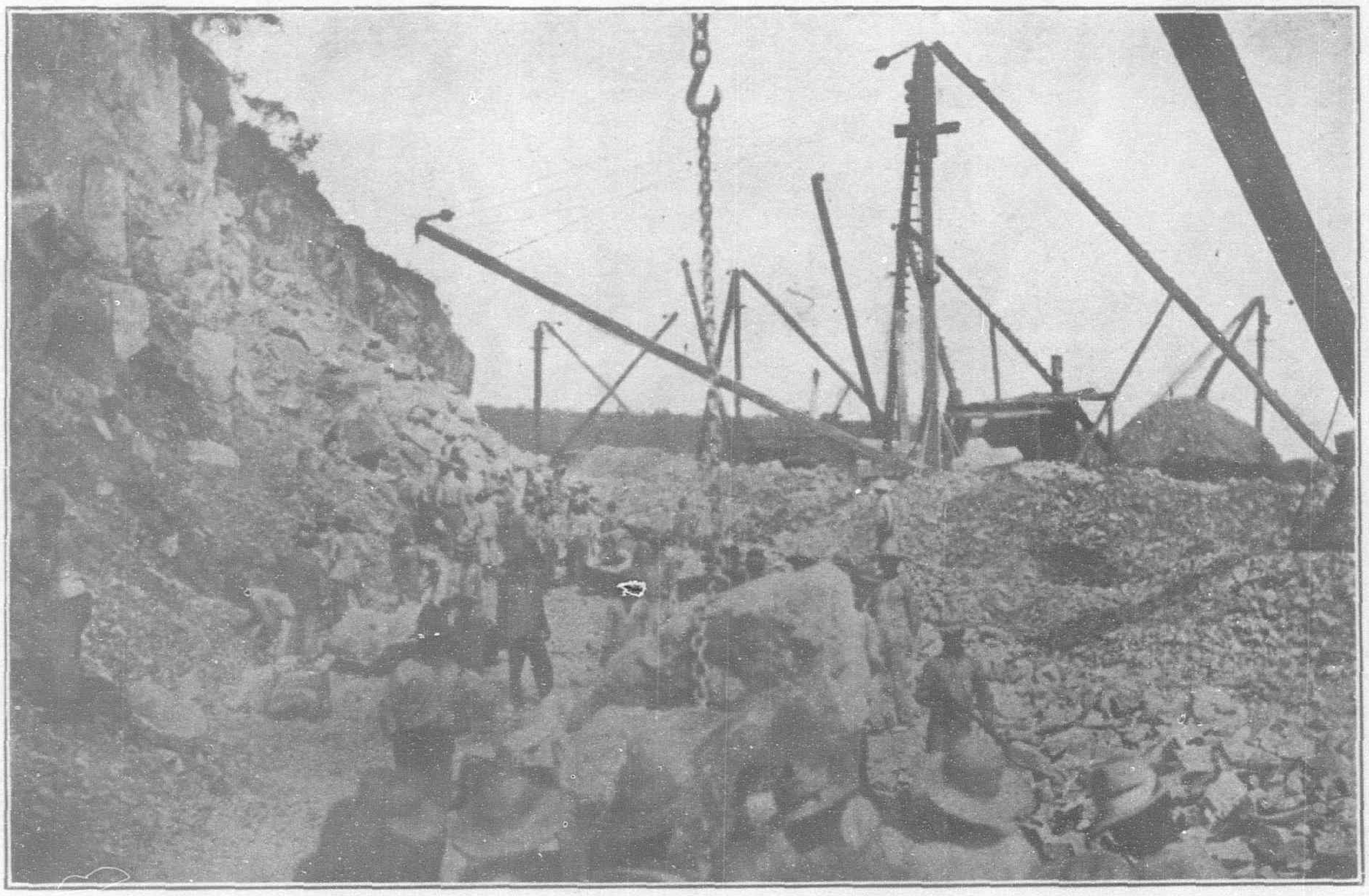
COLOSSAL PUBLIC WORK AT PRESENT BEING COMPLETED BY THE ATLANTIC, GULF AND PACIFIC COMPANY.

From an engineering standpoint the improvement of the harbor of Manila is a colossal success. At this writing there remains little yet to be done of the port works before the Atlantic, Gulf and Pacific Company, a strictly American concern with large experience in gigantic improvement schemes of this character, will be ready to turn over to the Insular Government the finest area of reclaimed dock land and one of the best, safest, and deepest harbors to be found anywhere throughout the Orient. It is estimated by Major C. McD. Townsend, Corps of Engineers, U S. Army, who has been in immediate charge of the improvement in the interest of the Government, that at the end of another six months the plans under which the contracting company undertook the project will have been consummated.

Just now it is impossible to estimate the benefits which will accrue to Manila as a commercial port, and through Manila to the whole Philippine archipelago, by reason of a modern harbor for shipping. Vessels will find here a haven which will shelter them from the dread typhoons of tropical waters. There will be an immense saving to commercial concerns in the handling of cargoes, because it is a foregone conclusion that eventually all the importing and exporting houses, and a majority of the manufacturing industries of Manila, will be located either upon the reclaimed dock land itself, or in close proximity thereto. The exorbitant cost of stevedoring will be eliminated and vessels of the greatest tonnage will be able to tie



HYDRAULIC DREDGE "MANILA" ON MARINE RAILWAY BUILT BY ATLANTIC, GULF AND PACIFIC COMPANY, FOR INSULAR GOVERNMENT, AT ENGINEER ISLAND.



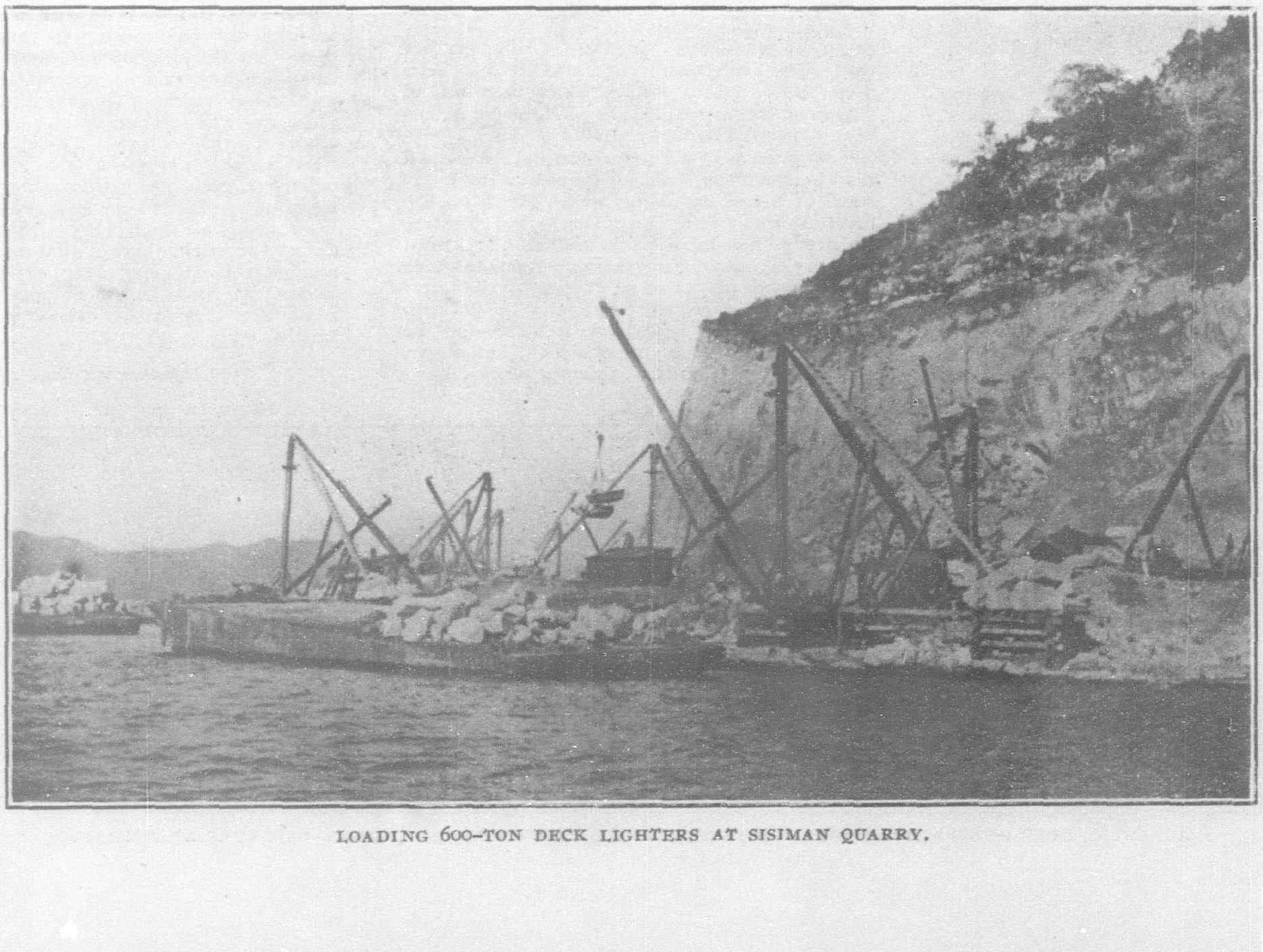
DERRICKS AT SISIMAN QUARRY HANDLING 15-TON ROCKS FOR BREAKWATER CONSTRUCTION.

up at the docks and discharge their cargoes at practically one handling. Thus will the cost of lightering freight be materially reduced, and this saving must necessarily prove a healthy impetus to industry and trade.

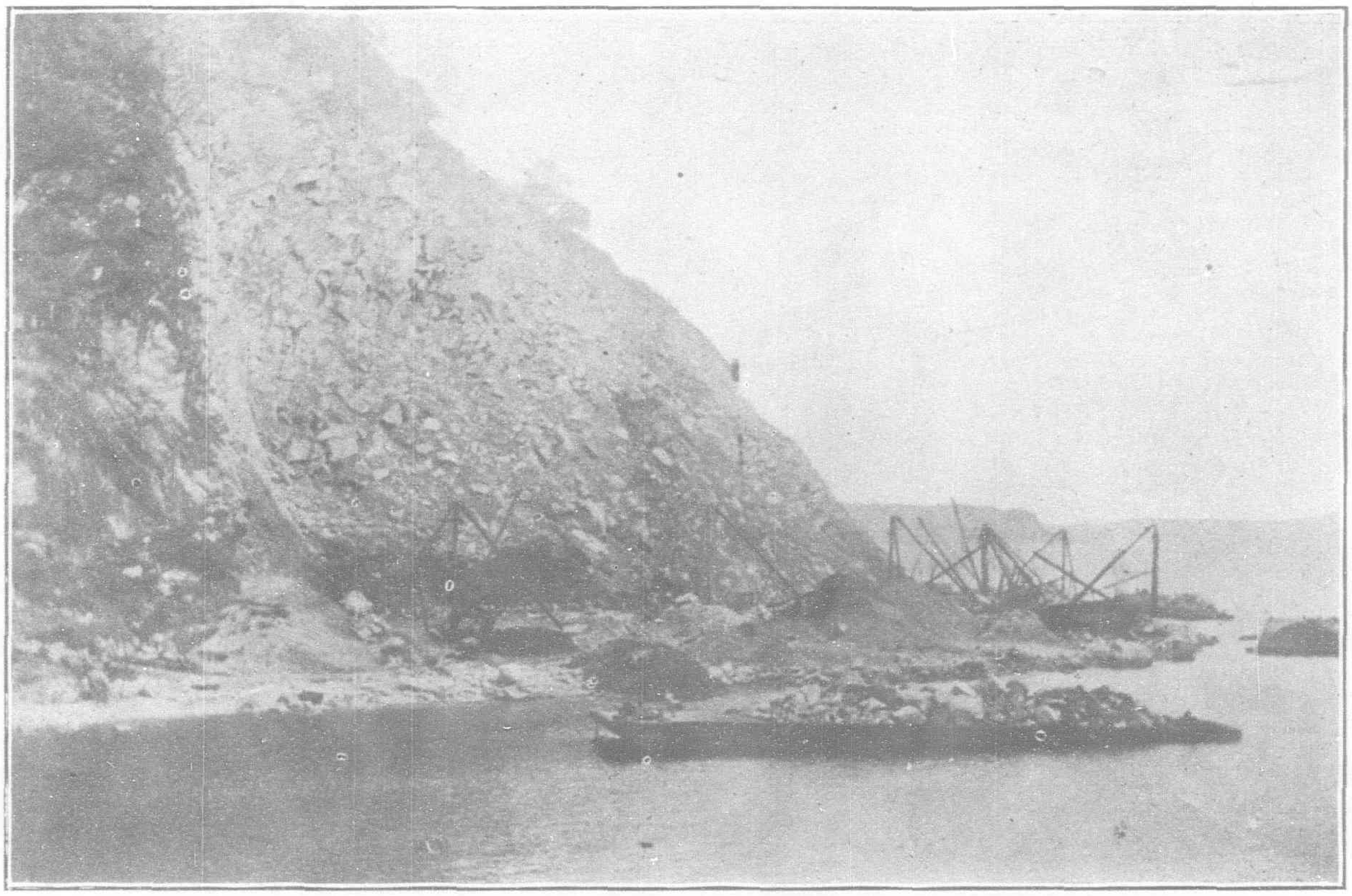
But it is not the intention of this article to dwell upon the economic phase of the harbor improvement; what has been accomplished in the line of engineering and construction will be dwelt upon to show how such a gigantic undertaking as this one can be accomplished within a comparatively short period.

The Americans did not begin the improvement of Manila Harbor. To the Spaniards is due the credit of the inception of the scheme, and its beginning. Major Townsend is authority for the statement that the Spanish engineers made very careful investigations into the project long before the Americans came to the Philippines, and that no less than five separate plans were submitted to the Madrid Government before final approval was given. The original scheme was submitted in 1882, but little work was done prior to 1892. From 1892 to 1896 a large portion of the west breakwater was constructed, and the walls of the canal and inner basin. These works were utilized in the project adopted by the American engineers, but the proposed east breakwater of the Spanish project was replaced by a detached breakwater, which greatly enlarged the basin of the harbor.

Bids for the completion of the works inaugurated by the Spaniards were invited by



LOADING 600-TON DECK LIGHTERS AT SISIMAN QUARRY.



LOADING BARGE AT SISIMAN WITH CABLEWAY, 1500-FOOT SPAN.

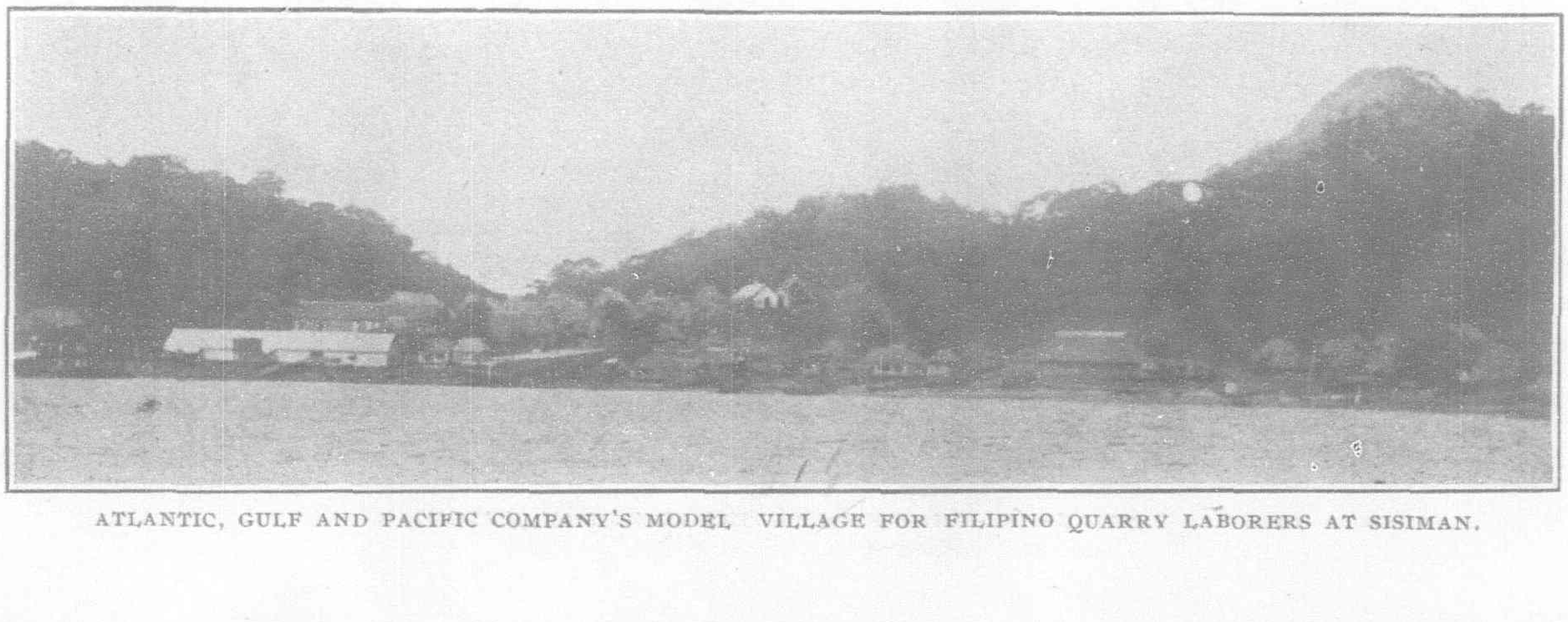
the Philippine Government in March, 1901. They were opened on August 1st of the same year, and the Atlantic, Gulf and Pacific Company, being the lowest bidder, secured the contract. The cost of the works was estimated by the Government at something like $2,250,000 gold.

According to the Government's specifications the general project consisted of a west breakwater extending from the Pasig River and following the Malecon line for a distance of 8,635 feet, and an additional breakwater of 2,785 feet to protect a harbor of about 380 acres. This harbor was divided into two subdivisions—an outer basin to have a uniform depth of 30 feet below low-water line, and an inner basin to have a depth of 18 feet below low water.

The Atlantic, Gulf and Pacific Company began work on the improvement in February, 1902. Preliminary to this it had built in the United States and brought out here the powerful hydraulic dredge *Manila*, specially designed for the work. The hull, which is of steel, was shipped to Manila "knocked down," and here the company rebuilt it and installed the machinery at its shipyard on the Malecon Drive. This craft is a Bowers dredge, and is among the most powerful and modern vessels of its type in the world. The first plate of the hull was laid in Manila July 1st, 1902, and the hull was launched November 15th of the same year, the dredge beginning its part of the work January 30th, 1903. In the building of the dredge here Filipino labor was almost exclusively employed. The machinery consists of one 1000-horse power high-speed, triple-expansion, surface-condensing engine, two double engines for the operation of the excavating and swinging devices, one engine for developing power for the electric light plant and machine shop, besides the necessary feed and fire pumps. To furnish steam for this plant four large marine boilers of the water-tube design are utilized. When the dredge is in operation one man controls all of its movements by levers, which are located in the pilot house. Some idea of the capacity of this dredge can be obtained from the fact that since it has been in operation it has been disposing of harbor mud at the average rate of 20,000 cubic yards a day. This material has been deposited behind a timber bulkhead 5,095 feet long, so as to form an area of reclaimed land between the Malecon Drive and the bulkhead of about 190 acres which constitute the future deep-water docks of the harbor. To date the dredge has deposited behind this bulkhead nearly 5,000,000 cubic yards of soil from an area in the harbor of 350 acres, deepening the latter within this space to practically a uniform depth of 30 feet below low-water line. The contract calls for a 30-foot depth, but allows for a 31-foot maximum. In some places, however, the contracting company has exceeded the maximum depth which, of course, accrues to the benefit of the Government.

While the Atlantic, Gulf and Pacific Company was getting its machinery in shape for the dredging, work on the bulkhead and the additional breakwater was pushed ahead. For this part of the improvement the Atlantic, Gulf and Pacific Company opened a quarry in a rich stone deposit at Sisiman, near Mariveles, at the entrance to Manila Bay. There the company established a village of nipa houses for the native laborers, upon whom, as the quarry work progressed, the company found that it could depend almost entirely to take out the rocks. In this village more than 1000 Filipino laborers were installed with their families, and by special legislation the Philippine Commission gave the company almost exclusive jurisdiction over the internal affairs of this colony. These Filipinos have lived here under great tranquillity and contentment, performing their labor in a manner most satisfactory to the company. They have been doing all the work of drilling and handling the rock, except that requiring great mechanical skill and long experience, which is done by American mechanics, under which head are classed derrick engineers, blacksmiths, etc.

(Continued on page 24.)



ATLANTIC, GULF AND PACIFIC COMPANY'S MODEL VILLAGE FOR FILIPINO QUARRY LABORERS AT SISIMAN.

RECONSTRUCTION OF SINGAPORE DOCKS AND WHARVES

Through the courtesy of the Colonial Secretary of the Straits Settlements, and also of Mr. Morphy, editor of *The Straits Times*, both of whom were prompt in forwarding copies to THE FAR EASTERN REVIEW, this paper is privileged to present the report on the proposed reconstruction of wharves and extension of dock accommodations at Singapore, together with a plan of the improvement under consideration, by Messrs. Coode, Son & Matthews and Mr. J. R. Nicholson, only recently made public. The report is incident to the probable acquirement of the Tanjong Pagar Dock Company's property, by the British Government. It follows:

GENTLEMEN:—On 29th February last you addressed a letter to Messrs. Coode, Son & Matthews, wherein you instructed that firm to consider and report upon certain improved wharf and dock works, proposed to be constructed at Tanjong Pagar, in Singapore Harbor, in accordance with the recommendations made by Mr. J. R. Nicholson, M. Inst. C. E., in a report which he presented to the directors of the Tanjong Pagar Dock Company, dated 9th January this year.

2. At a meeting of your London committee, which Mr. Matthews attended on 3rd May, it was decided, as being the most ready and satisfactory mode of dealing with this matter, and for complying with the instructions conveyed in your letter of 29th February, that Mr. Nicholson should come home in order to confer with Messrs. Coode, Son & Matthews, with respect to his recommendations, and to furnish certain further information and particulars bearing thereon, which were not at that time available here.

3. In compliance with this decision, Mr. Nicholson returned to England on 29th June, since which date we have been in frequent consultation relative to the contemplated works.

4. Having now fully considered the proposals in detail, and further studied the physical conditions of the site, based on the information brought home by Mr. Nicholson, we have together revised the former designs, where thought to be necessary, and now beg to submit the following joint report, which has been prepared in accordance with the verbal instructions issued at a meeting of the London committee on 6th ultimo.

EXISTING FACILITIES AT TANJONG PAGAR.

5. The positions and general extent of the existing wharves, godowns, drydocks, &c., at Tanjong Pagar, are shown by black lines on the general plan which accompanies this report.

6. The company's wharves (reading from left to right on the plan) are known as the Borneo wharf, Main wharf, Sheer's wharf, and East wharf extension. Jardine's wharf being leased to the company, its reconstruction has not been taken into account in the estimates.

7. The wharves are constructed of wood piling braced together, and carrying a timber superstructure.

8. The teredo, a marine worm, being extremely active in these waters, structures of timber are considerably and rapidly affected thereby; in fact, works of this description, cannot under any circumstances, be considered as of a durable or satisfactory character, having regard to the prevailing conditions. As an indication of the activity of worm action at Tanjong Pagar, we may observe that it has recently been found necessary to renew a section of the wharf, which was rebuilt only four years ago. Timbers which are reputed to resist worm action, under ordinary conditions, have been tried at Singapore, but not with satisfactory results, piling, of such material, being riddled by the worm, to a depth of some inches, after a period of immersion of from six to seven years. Creosote and other preservatives, which are effective under some conditions, do not afford any appreciable protection, or add materially to the durability of timber structures, where the worm is so active as at Singapore.

9. The expenditure on repairs, exclusive of extensions, during the past eleven years, is as follows:—

	£	s.	d.
1893 … … … … …	1,500	0	0
1894 … … … … …	1,485	0	0
1895 … … … … …	2,383	0	0
1896 … … … … …	4,069	0	0
1897 … … … … …	5,028	0	0
1898 … … … … …	4,777	0	0
1899 … … … … …	5,786	0	0
1900 … … … … …	6,606	0	0
1901 … … … … …	4,146	0	0
1902 … … … … …	7,726	0	0
1903 … … … … …	13,247	0	0
	£56,753	0	0

Latterly the expenditure on renewals has considerably increased, and if the wharf is to be kept in good working order, the outlay on this head will not be reduced in the future. The extra expenditure during 1903 may be considered as exceptional, inasmuch as specially heavy renewals were carried out, so that, at the present time, the wharf, as a whole, may be considered as being in a good state of repair.

10. A wharf, having a wooden floor, where hand trucking has to be done, is a source of double expense, if not kept in perfect order, in consequence of the extra rapidity of wear, and the increased labor required to truck cargo over an uneven surface.

11. The irregular face-line of the wharves is due to their construction, in sections, on lines which were considered, at the time, as possessing sufficiently deep water for the draught of vessels then calling at the port. For the accommodation of small vessels these irregularities are of but little consequence; owing, however, to the increased length of modern steamers, considerable inconvenience is sometimes caused in working their cargo when alongside. It is proposed, therefore, to modify and straighten the face line as described, hereafter, in clauses 47 to 53 inclusive.

12. The present depth alongside the wharves, at low water of ordinary spring tides, is as follows:

Position.	Depth of water less than 25 ft. at L. W. O. S. T.	Depth of water more than 25 ft. at L. W. O. S. T., and less than 30 ft.	Depth of water more than 30 ft. at L. W. O. S. T., and less than 33 ft.	33 ft. at L. W. O. S. T. and upwards.
Jardine's Wharf..	318 ft.	….	….	….
Projecting Wharf.	437 ,,	….	….	….
Main Wharf ……	2,650 ,,	1,050 ft.	445 ft.	450 ft.
Sheer's Wharf….	180 ,,	185 ,,	….	….
Back of East Wharf Extension	520 ,, (17 ft. 0 in. depth.)	….	….	….
East Wharf……	955 ,,	290 ,,	….	….
	5,060 ft.	1,525 ft.	445 ft.	450 ft

Total 7,480 lineal feet of wharves.

13. It will be seen from the foregoing that out of a total length of quay, of 7,480 ft., only 2,420 ft. are available for vessels drawing more than 25 ft. From this, however, should be deducted 290 ft. at the eastern end of the East wharf extension, and 185 ft at the Sheer's wharf, the former having no warehouse accommodation and the latter being often occupied by ships under repair, for which purpose it ought to be reserved. There is also on the Main wharf a length of 520 ft. between sheds Nos. 26 and 30 (near the site of the entrance to the proposed wet dock) where there is no warehouse accommodation.

14. It follows from the above, that at present there are only 1,425 ft. of useful cargo wharf, available for the largest class of ocean steamers, now using the port, so that vessels of this class, often anchor in the roads to await berthage, when there is available length, but insufficient depth, to accommodate them. It is proposed to provide deeper water alongside as described in Clause 54.

15. The godowns on the existing wharves, which are mostly constructed of corrugated iron, are of light scantling, and inconveniently arranged for the economical handling of cargo. Inasmuch as the carrying out of the proposed reconstruction of the main wharf will entail their removal, as shown on the plan, new godowns of an improved character and arrangement are provided for in the estimates, see Clause 61.

16. A single line of railway, connecting the different wharves, is laid at the back of the present godowns, and is provided with crossing loops. This line is being doubled, which will greatly increase its usefulness. Owing, however, to the godowns not being placed on any definite line, the distance varies between them and the railway, which necessitates more manual labor, in handling cargo, than would be the case were the godowns built on a proper system, so that the rails might be laid in close proximity to them.

17. The present coaling facilities and the despatch given to vessels requiring coal will compare favorably with any port in the East. The storage capacity at Tanjong Pagar is at present limited to about 200,000 tons, due in a great measure to the method of storing in heaps, whether under cover or in the open. The coal does not belong to the dock company, who store and handle it only for consignees. The waste of space is considerable, as about 400 different parcels have to be kept separate, in consequence of the large number of owners and the variation in the character of the coal. No mechanical appliances are used for handling.

18. The company carry on an extensive shipbuilding, docking, and repairing business at Tanjong Pagar and at Keppel Harbor. The workshops, in connection with the docks, are well equipped with machinery, suitable for the carrying out of the largest class of ship and engine repairs.

The dimensions of the graving docks are:—

VICTORIA DOCKS (Tanjong Pagar)—
450 ft. 0 in. in length.
65 ft. 0 in. width at entrance.
20 ft. 0 in. depth of water on cill at H. W. O. S. T.

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ALBERT DOCK (Tanjong Pagar)—
480 ft. 0 in. in length.
60 ft. 0 in. width at entrance.
21 ft. 0 in. depth of water on cill at H. W. O. S. T.

No. 1 DOCK (Keppel Harbor)—
415 ft. 0 in. in length.
42 ft. 0 in. width at entrance.
15 ft. 0 in. depth of water on cill at H. W. O. S. T.

No. 2 DOCK (Keppel Harbor)—
444 ft. 0 in. in length.
65 ft. 0 in. width at entrance.
19 ft. 0 in. depth of water on cill at H. W. O. S. T.

19. The lower altars of the Victoria and Albert docks are narrower than the entrance, and as the greatest beam of most modern cargo vessels is over the bilges, it has been considered desirable to remove these lower altars, in order to take full advantage of the widths of the entrances. This improvement, at the Victoria dock, is well advanced, and the necessary work has been commenced at the Albert dock. When the above is completed it is intended to lengthen one of these docks.

20. With the exception of the graving dock and repairing department, the existing facilities are taxed to the utmost, and are entirely inadequate to meet the increasing demands of the port.

PROPOSED WORKS.

21. In considering the scope and character of the proposed works and their design, we have kept in view their first cost, paying due regard to the benefits to be obtained; also the reduction of future maintenance charges, as far as practicable, the relief of the present congestion in the shortest time, and the carrying out of the new works with as little inconvenience as possible to the existing berthage. The improvements which are most required, and which should receive prompt attention, are the provision of increased deep water berthage, more perfect arrangements for dealing with the transhipment of cargo, improved coaling facilities, and additional storage for cargo in close proximity to the wharves, or having easy access thereto. To meet these requirements it is proposed to construct a new wet dock, in the lagoon southward of Keppel Road, and to rebuild the present Main and Borneo wharves on improved and permanent lines, having deep water berthage alongside.

22. The general plan which accompanies this report, shows the existing works in black and the proposed works of improvement in red. The southern ends of the moles and of the proposed quay at Telok Ayer, in connection with the Government harbor project, are indicated by brown tint. The results of the borings, taken on the sites of the works at Tanjong Pagar, are given in detail, and the sources from which this information was obtained, are described on a note on the plan.

23. The navigable depth in the Suez Canal fixes the draught limit of ships from Europe. We understand that since 1st January, 1902, the maximum draught of vessels permitted in the canal is 26 ft. 3 ins. It is, we believe, anticipated that in a year hence, this maximum draught will be increased to 27 ft. 10 ins., and in three years hence to 29 ft. 6 ins. The trade between the Pacific ports and India must also be taken into consideration.

24. There can be no doubt that, in the near future, the draught of large vessels will be considerably increased. Shipbuilders have been hitherto limited, in this respect, by the accommodation afforded by existing docks. Where new docks are in course of construction, provision is being made for vessels of greater draught. The Northern Railway of America has now two vessels, in the China trade, having a load draught of 33 ft.

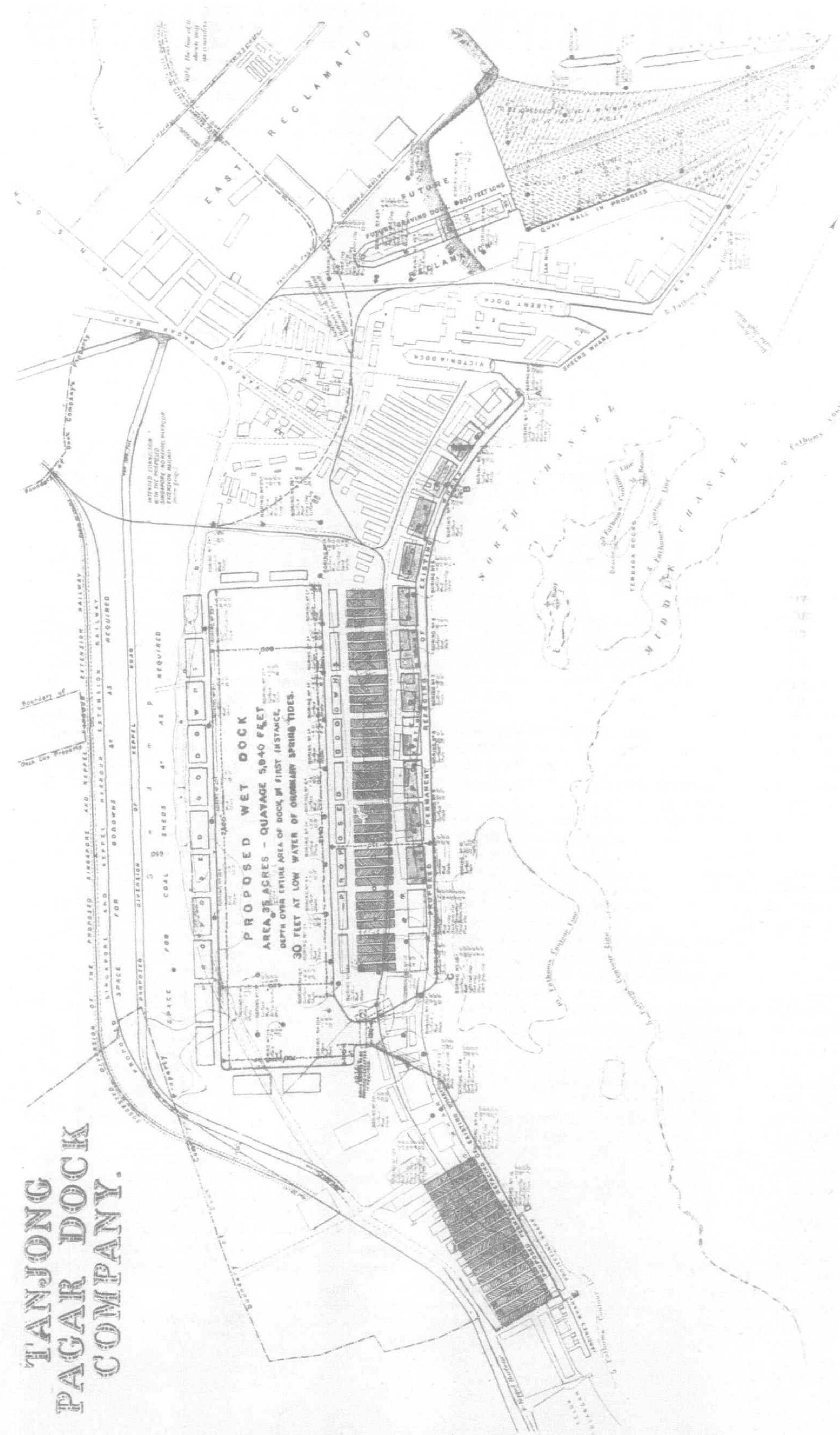
25. It is recommended that the minimum depth alongside any of the proposed wharves and quays shall be, in the case of the wet dock, 30 feet at L. W. O. S. T., in the first instance, the foundations for the quay walls being carried down, in order to admit of this depth being increased by dredging to 33 feet at L. W. O. S. T., should it be found expedient to do so at any future date.

The minimum depth alongside the re-constructed main wharf ward would be 33 feet at L. W. O. S. T.

PROPOSED LAGOON WET DOCK

26. The site lying between the Main wharf and Keppel Road is undoubtedly the most central and advantageous position for quay and wharf extensions. Being contiguous to the Main wharf, it lends itself to the quick interchange of transhipment cargoes and for coal discharging.

27. It will be noted that the site of the dock necessitates the putting back of Keppel Road in order to form a basin of sufficient width. The proposed diversion of this road is shown on the plan, and its adoption allows sufficient space for a dock of 600 ft. in width, and for the formation of an area of 400 ft. wide between the north quay of the dock and the diverted road, which would be available for quay space, godowns, roads, railways and coal storage. These last named are highly important accessories for the convenient working of the trade in connection with the dock, and although we believe the space as proposed will be found adequate, it cannot be regarded as excessive. Convenient approaches to the dock would be arranged along the new road.


TANJONG PAGAR DOCK COMPANY.
PROPOSED WET DOCK
AREA 35 ACRES - QUAYAGE 5,940 FEET
DEPTH OVER ENTIRE AREA OF DOCK IN FIRST INSTANCE,
30 FEET AT LOW WATER OF ORDINARY SPRING TIDES.
EAST RECLAMATION
FUTURE GRAVING DOCK
QUAY WALL IN PROGRESS
ALBERT DOCK
VICTORIA DOCK
NORTH CHANNEL
MIDDLE CHANNEL
KEPPEL ROAD

PLAN OF PROPOSED RECONSTRUCTION OF WHARVES AND EXTENSION OF DOCK ACCOMMODATION AT SINGAPORE, STRAITS SETTLEMENTS.

The estimates include the proposed road diversion, together with the tramways, feeder cables, gas pipes, lamps, etc., in connection therewith.

28. In order to afford sufficient space for godowns, offices, etc., and a suitable road at the back thereof, we have shown on the plan a proposed slight amendment in the line of the contemplated Singapore and Keppel Harbor Extension Railway, which, we trust, will be approved. It will be observed that the new line is practically parallel to the proposed Keppel Road diversion, and also to the line of the railway extension, as formerly intended, and at a distance of 80 feet therefrom. This arrangement, in view of the construction of the new dock, will entail the least waste of land, and allow of the ground being laid out on a systematic plan, for future building purposes, etc.

29. The additional wharfage which would be provided in the new dock is a follows:—

North Quay	2,500 feet.
South Quay	2,140 ,,
East Quay	600 ,,
West Quay	700 ,,
Total ...	5,940 feet.

The south side of the dock will be particularly adapted for transhipment cargo, and for vessels discharging coal, while the north side would be well suited for local cargo. The area of the dock, as will be observed from the plan, is 35 acres, the depth over the whole of which, in the first instance, would be 30 feet at low water of ordinary spring tides, the walls being carried down to admit of the formation of a depth of 33 feet hereafter, if required, as explained in Clause 25.

30. The entrance to the proposed dock will be 120 feet in width, and will be placed in the position shown on the plan. At this spot the solid ground, on the line of the Main wharf, forms a gulley of considerable depth. A heavy expenditure would, therefore, have been necessary, were the wharf reconstructed on permanent lines at this point. The site of the entrance as selected is, moreover, the most favorable which could be adopted, for ships entering or leaving the dock, both with regard to tidal currents and the depth of water available for manœuvring outside.

31. It will be noted that the entrance will, to some extent, and in the absence of a swing bridge, isolate Borneo wharf. We do not, however, consider this will prove such a disadvantage as at first sight might appear, especially as it is proposed to use this wharf for ships requiring bunker coal, for which traffic, direct, or rail communication, with the Main wharf, is not necessary. It is imperative that the entrance to the dock should be of adequate width, in order to provide for easy access and departure, and for diminishing the current in the channel-way itself. The least width that will comply with the conditions is 120 feet, and the cost of a swing, or rolling bridge, to cover such an opening, would be disproportionate to the benefits to be derived therefrom. A bridge, supported partially by its own flotation, would be less costly but would be unsuitable, as the entrance would have to be kept almost continually open to allow of the passage of lighters and smaller craft.

32. We do not consider that the convenience which would be gained, by directly connecting the two wharves by road and railway over a narrow entrance, would at all equal the advantages following on the adoption of a wide, convenient, and safe entrance to the dock. There would, of course, be railway and road connection with the Borneo wharf, along the north side of the proposed dock, and if at any future time it is found necessary to erect a bridge, the walls at the entrance have been designed of sufficient strength to carry it.

33. The walls of the dock would be constructed of concrete-in-mass. They have been designed of ample strength, and would be furnished with a granite coping throughout, and also with suitable hard wood fenders with easily renewable face pieces. Iron ladders are likewise included, placed at convenient distances. An ample number of cast steel mooring bollards are allowed for, to be fixed along the copings.

34. A distance of 35 feet is proposed between the quay line and the face of the godowns. The surface would be formed of concrete, laid on well-packed hard filling; the concrete is not to be laid until the filling has become thoroughly consolidated. Although there is an objection to the use of concrete for this purpose, in consequence of its liability to crack and to form inequalities in its surface through settlement, it is believed, on the whole, to be the best material which can be used for the purpose, in this particular case. Wood, laid on the ground, would soon deteriorate from the attacks of white ants, and granite paving would not provide a sufficiently smooth surface for hand trucking, which must be provided for at Tanjong Pagar.

35. The general arrangement of the proposed godowns is shown by deep red color on the plan. Those on the North and West quays will be 200 feet in length by 100 feet in width, and will be used principally for local storage purposes. The transhipment godowns, on the South and East quays will also be 200 feet in length, but of 50 feet in width only. This arrangement allows for ample accommodation, having regard to the character of the trade to be carried on, and provides room for larger coal storage for the Main wharf.

36. The new godowns will be constructed on an improved plan and of greater strength than the existing buildings. The floors will be of concrete. More light will be provided than at present, and improved facilities afforded for loading into railway wagons, or carts, at the back.

37. The total area of floor space in the proposed godowns, to be provided for the new dock, is 315,000 sq. ft., which will allow for the storage of, approximately, 75,000 tons of general cargo.

38. Two lines of railway will be laid along the quay in front of the godowns, connecting, at convenient intervals, with other lines at the back. Each set of lines will be provided with crossing loops. The whole will be connected with the company's general system, and through it with the Singapore Government Railways.

39. For a time, at least, it is not proposed to equip the quays with cranes or special machinery. It is desired, in the first instance, to avoid the considerable additional expenditure which would be required thereby. It is moreover thought, in view of the cheapness of coolie labor, that such further expenditure might, without material inconvenience, be deferred for a time. Advantage from the use of cranes would follow from the larger area which could be served by them, as compared with the use of ship's cranes or derricks, thus facilitating the sorting and clearing away of cargo from the ship's side. Electric power, owing to its adaptability to various requirements, and the same installation being capable of supplying power and light, would probably prove the best and most economical system to adopt. Undoubtedly a mechanical installation will have to be provided, at no distant period, in order to give quick despatch to ships. Possibly, as the dock construction proceeds, a reconsideration of this question may show that the further expenditure required for an efficient electrical installation, would be justified under the circumstances, so that the machinery might, in that event, be provided, in order to be ready for use by the time the dock is open for traffic. The approximate cost of an electrical outfit for the dock may be taken at £130,000, including erection in place ready for work. The estimates given in Clause 75 provide for the electric lighting, only, of the dock.

40. The total amount of excavation in dock and foundations for the quay walls of same is 2,260,000 cubic yards. Of this quantity 1,034,000 cubic yards will be required for filling up to the south boundary of the proposed Singapore and Keppel Harbor Extension Railway. The remainder, 1,226,000 cubic yards, will be available to fill in 63 acres of swamp land, lying north of the proposed railway, to a depth of 12 feet. The area so reclaimed would then become a valuable asset to the company.

41. Provision has been made in the estimates for efficient drainage of the surface water from the roads, godowns, and latrines. Rubbish bins, etc., have also been provided for.

42. The whole of the work in connection with the dock would be carried out in a dried area. The sea would be excluded by a temporary dam, constructed across the present opening to the lagoon, and carried well into the existing banks. Provision has been made for draining the surface water, during construction, from the low-land lying north of Keppel Road, and discharging it through a tide flap placed near the west end of the dam.

43. The use of a powerful pumping plant, for keeping the works dry during construction, is included in the estimates.

44. It is proposed to construct the dock by contract, to be let, after competition, to one of the large firms, possessing the necessary plant and experience for the proper and expeditious execution of the works. It is believed this mode of procedure will prove more economical and satisfactory to the company, than the carrying out of the dock departmentally.

45. We are strongly of opinion that the proposed wet dock should be carried out, in its entirety, as one project and not in sections. This will certainly be found the most economical mode of procedure, and enable the new and improved berthage in the dock, to be utilized during the carrying out of the proposed works in connection with the main or outer wharves. About six years, from the date of the decision to proceed with the dock works, will be required for their full execution, or five years from the actual commencement of the undertaking, a year being necessary for the preparation of the contract documents, inspection by contractors' representatives, letting the contract and arranging the preliminaries.

MAIN WHARF.

46. The main wharves, between Victoria graving dock and Borneo wharf, offer the most attractive berthage for large ships and the most convenient center for dealing with transhipment cargo.

47. As mentioned in Clause 8, timber is unsuitable for such work and costly to maintain. The whole wharf, therefore, should, in our opinion, be replaced in a more permanent manner. We recommend, as the proper—and in the end the least costly mode of procedure—that a new wharf wall, formed of concrete blocks should be constructed, where a good foundation is available, at a depth not exceeding, say, 40 feet below L. W. O. S. T. Where a suitable foundation can only be obtained at a greater depth, we propose to construct the wharf by sinking steel cylinders, carrying a steel and concrete superstructure.

48. The relative lengths of the two systems of construction are shown on the plan. Reading from right to left they are as follows:—

From A to B, including return to Victoria graving dock entrance, 825 lineal feet of steel cylinder construction.

From B to C, 2,600 lineal feet of block wall.

From C to D, including the two returns to form the entrance to the proposed wet dock, 1,500 lineal feet of steel cylinder construction.

From D to E, 510 lineal feet of block wall.

49. The total lengths of the two systems are:—

Block wall, 3,110 feet.

Steel cylinders, 2,325 feet.

Total length of wharf to be reconstructed, including the return to Victoria graving dock and the two returns to the new wet dock, will thus be 5,435 feet.

50. The proposed line for the new wharf is down in red color on the accompanying plan, and is, on the average, about 40 feet beyond the existing face line.

51. In consequence of the adoption of the block wall system of construction, it is of the greatest importance that the foundations of the new work should be clear of the old piles and pile stumps of the existing wharf, the drawing of which would be tedious and very costly.

52. The proposed line of frontage will be beneficial in increasing the space for godowns, roads, etc., and will provide an area of 550 feet in width between the South quay of the proposed wet dock and the front of the main wharf; the average width, at present, between the lagoon and the wharf face is approximately 400 feet.

53. The carrying forward of the wharf line, as proposed, would not interfere with the existing currents in the harbor, or be prejudicial to navigation in any degree.

54. The minimum depth, alongside the reconstructed wharf, will be 33 feet at low water of ordinary spring tides. Very little

dredging will be required, beyond what will be necessary for founding the wall.

55. The foundations will be excavated by grabs and levelled by divers working in bells. The blocks would be laid from an overhead staging, to be taken down and re-erected in advance, as the work proceeds. This method of construction will necessitate about 500 feet of wharf being out of use at a time.

56. The maximum weight of the blocks will be 20 tons. They will be moulded on east reclamation, brought to the site by lighters, and placed in position by overhead travelling cranes. The blocks, above the low water line, will be faced with granite masonry, bonded into the concrete backing.

57. The quay space along the Main wharf, between the edge of the coping and the face of the godowns, will be 45 feet in width. Where the block-wall method is adopted, the wharf would be furnished with bollards, fendering, ladders, etc, as described for the walls of the wet dock.

58. The steel cylinders will be 8 feet in diameter, having lower rings of 10 feet in diameter, in order to increase the bearing area. They will be sunk through the soft material to the hard bottom, and filled solid with concrete. The cylinders will be spaced 20 feet apart center to center, longitudinally, and 25 feet 3 inches apart, transversely. They will be well braced together above L. W. O. S. T. The superstructure, or deck, will be of continuous steel troughing, covered with concrete. The exposed steel of the cylinders, where likely to deteriorate by corrosion, will be efficiently protected by a casing filled with Portland cement.

59. The sinking of the cylinders will not interfere to a serious extent with the carrying on of the ordinary work at the existing wharves. Moreover, in future, when repairs are necessary, instead of driving new piles, the permanent cylinders should be sunk. A temporary decking would, in that event, be required, until sufficient cylinders have been provided to admit of the formation of a section of the new wharf, when the outside cylinders could be put down, and a permanent decking subsequently laid of the character described.

60. Some difficulty may be experienced in sinking the inner cylinders, in consequence of the presence of pile stumps, which may possibly necessitate the use of the pneumatic process for sinking, in order to effect the removal of such obstructions.

61. Fourteen godowns have been provided for in the estimates each 200 feet in length and 100 feet in width, of a similar design to those described for the wet dock, thus giving a general cargo storage capacity of about 67,000 tons. In addition to the above, there will, of course, be the existing storage godowns on the eastern extension and reclamation ground.

62. The present lines of railway behind the existing godowns will be slued into position with regard to the new godowns. Two lines will be laid along the front of the wharf with suitable connections to those behind the godowns, and the whole system connected at Borneo wharf, and also near the east end of the proposed wet dock, with the Singapore and Keppel Harbor Extension Railway. A junction will also be provided with the railways in connection with the proposed Government harbor project.

63. We are of opinion that the reconstruction of the wharf should be carried out departmentally, as it would not be practicable, keeping in view the character of the work to be done and the conditions under which it would have to be executed, to let a contract for its construction, without opening up serious questions with the contractor, which might not improbably give rise to large claims for compensation.

64. The full reconstruction of the Main wharf to the extent recommended, would, we consider, occupy about ten years from the date of its commencement, which latter would follow upon the completion and opening out traffic, of the proposed wet dock.

65. The berthage alongside the reconstructed Main Wharf, having a depth of 33 feet at L. W. O. S. T., would be 4,535 feet as compared with the existing accommodation of 895 feet having 30 feet and upwards at L. W. O. S. T., and 2,420 feet having 25 feet and upwards.

COALING FACILITIES

66. Having regard to the extent to which coaling is done at Singapore, and keeping in view competition and labor difficulties, which are becoming more acute every year, the question of giving quick despatch to vessels, requiring bunker coal, is one of vital importance. The introduction of mechanical appliances for this purpose, along the proposed new Main wharf, to be worked in conjunction wih the handling of cargo, is practically impossible, as such appliances with conveyors, etc., would inevitably hamper the cargo work, if carried on at the same time. Vessels loading, or unloading cargo, in nearly all cases can "bunker" in much less time than they can complete their cargo arrangements.

67. The total quantity of coal delivered over the wharf at Tanjong Pagar in 1901 was 550,534 tons; 1902, 524,442 tons; 1903, 510,352 tons, of which in—

1901	139,095	tons; were delivered to steamers bunkering only.
	160,425	tons were delivered to lighters.
	299,520	total
1902	109,662	tons were delivered to steamers bunkering only.
	177,793	tons were delivered to lighters.
	287,455	total.
1903	102,490	tons were delivered to steamers bunkering only.
	150,689	were delivered to lighters.
	253,179	total.

68. From the foregoing it will be seen that more than one-half the total quantity of coal, delivered during the past three years, could have, had facilities existed, been dealt with at some position entirely independent of the main cargo wharves, thus freeing the latter and offering an opportunity for the introduction of a quick-handling coal plant.

69. The chief difficulty in arranging machinery for this last-named object, is the diversity of designs with reference to ships' bunkers; the hatches, shoots, or alleyways, leading thereto; and the facilities for trimming. In the newer ships more attention is being paid to these important points.

70. The proposed coal bins are shown on the general plan behind the godowns on the Main wharf. The principal advantage to be derived from these, would be, that as they are arranged on a definite system, each parcel of coal could be easily kept separate, without the waste of space now necessary for this purpose. The cost of these bins, approximately £80,000, is not included in the estimates given in this report

71. Estimates have been prepared for mechanical conveyors, for discharging from the ship direct, to the coal bins. The cost and working charges of this special plant will not, however, compare favorably with the present method, as long as there is a good supply available of Chinese labor. If, as is not improbable, labor becomes dearer, and possibly inadequate in quantity, then the provision of mechanical appliances, for handling coal, will no doubt come forward for further and serious consideration.

72. An installation of electric power cranes, for the Main wharf, to be used in connection with the handling of general cargo, would neccessitate a special expenditure on this head of £75,000. This wharf is already lit electrically.

73. As mentioned in Clause 68 a wharf should be set aside for ships requiring bunker coal only, and having no cargo to be deal with. The most suitable position for the carrying on of such operations, is the western end of Borneo wharf, where bins are shown on the plan, having a capacity of 80,000 tons.

74. Mechanical appliances for discharging coal and for bunkering, might not improbably be employed here with advantage. The plant would not be of so complicated a character, as that for the Main wharf, and would not be hampered by cargo arrangements. As, under any circumstances, the wharf will not be ready for such appliances for a considerable period, it will be wise to await and note developments in this class of machinery, before settling on any fixed system.

75. We estimate the cost of the works which we have recommended for adoption as follows:—

PROPOSED WET DOCK AND WORKS IN CONNECTION THEREWITH—

Proposed wet dock complete, including pumping and cofferdam, forming surface of quays, railways, roads, drainage of permanent works, fencing, drainage during construction, electric lighting, the diversion of Keppel Road and the execution of the works which are necessary in connection therewith		£725,000
Godowns		65,000
Total cost of wet dock and work in counection therewith ...		£790,000

PROPOSED RECONSTRUCTION OF MAIN WHARF—

Concrete block wharf wall and works in connection therewith, including formation of surface of quay	£355,000	
Length of wharf, where steel cylinder construction is necessary... ...	345,000	
Reconstruction of godowns	40,000	
		740,000
Total estimated cost of proposed works...		£1,530,000

76. The foregoing estimates include reasonable allowances to provide for contingencies. They do not, however, cover the cost of an installation of electric cranes, either for the wet dock or the Main wharf, to which reference is made in Paragraphs 39 and 72, and for which special and additional estimates are there given. These last-named figures are exclusive of the cost of power-house and boilers, which are now available.

77. If the wet dock were made 700 ft. in width, instead of 600 ft. as shown on the plan, the additional cost would be £50,000. Seeing that it is intended to berth the largest steamers at the outer, or Main wharf, we are of opinion that a width of 600 ft. will be found sufficient to meet the conditions, keeping in view the foregoing.

78. A quay wall and wharf are now in course of construction, to the east of the east wharf extension, in the position shown on the plan, and a depth of 30 ft. at L. W. O. S. T. will be provided alongside the same. This area is now being dredged. In connection with this wharf and the deep-water area referred to, it is intended to dredge the bed of the basin, over the further areas, crossed by red lines on the plan, in order to produce the depths thereat, which are described. The cost of these works is being defrayed out of revenue.

(Continued on page 37.)

CHURCH ARCHITECTURE IN THE PHILIPPINE ISLANDS

Architecture, like everything else on this earth, has passed through many and many a transformation. Lifted to the cuspid of excellence and perfection it dropped down again almost to barbarism, not to say savagism, only to raise its head again to be anew, and anew hurled to the ground. The history of architecture is the history of nations, of mankind; it is the expression of the soul's aspiration of each race and it, more than anything, tends to prove the common origin of all civilized nations and the bonds which link them to their savage and barbarian ancestors. The absence of architectural ruins in a newly discovered country is an absolute proof that it has never been inhabitated by others than the crudest of savages. No land which ever had a history lacks these silent witnesses, these vestiges of a great past, although calamities, invasions or cataclysms may have wiped out entire races.

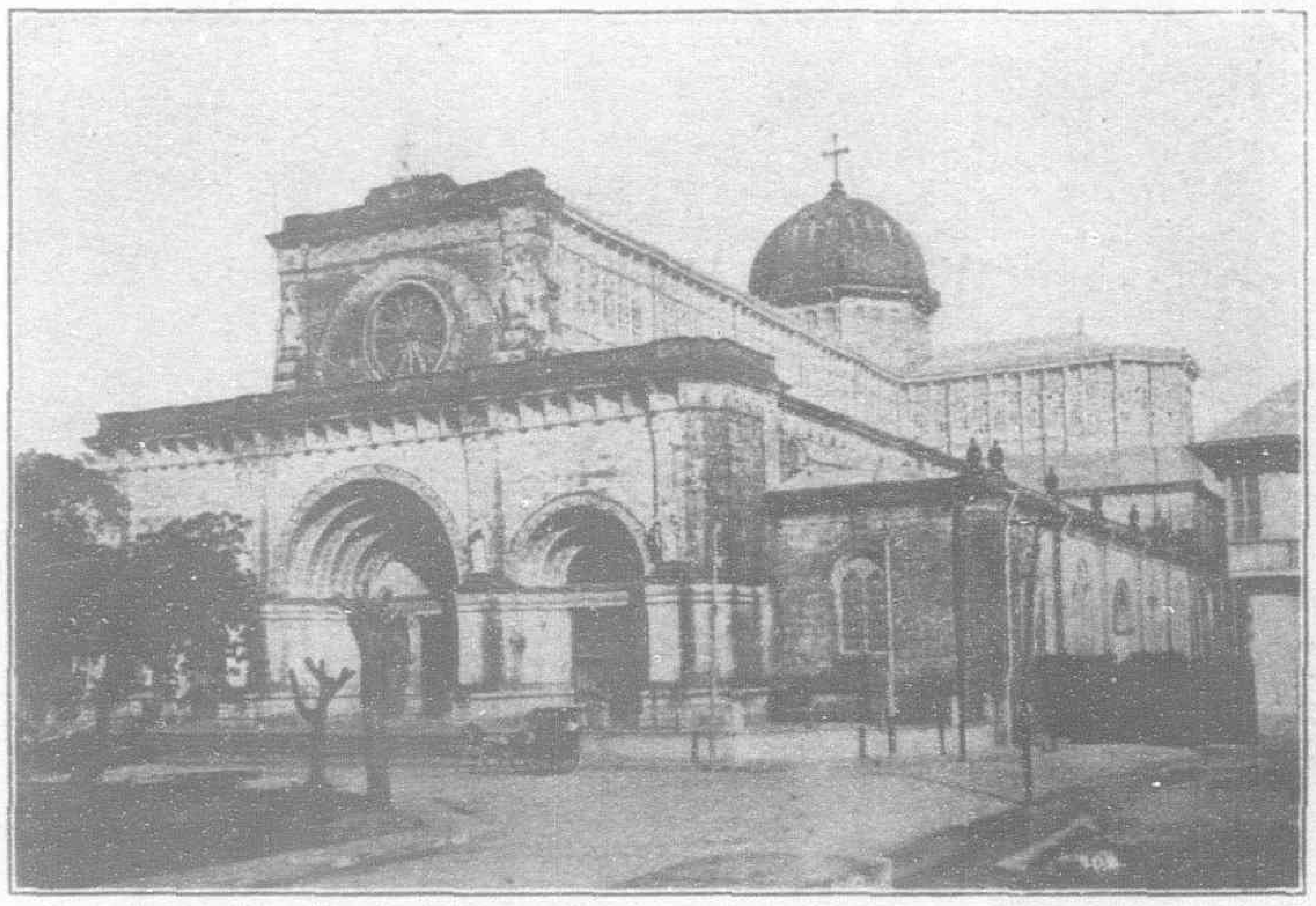


Photo by Squires, Bingham & Co., Manila.

MANILA CATHEDRAL AS IT APPEARS TODAY.

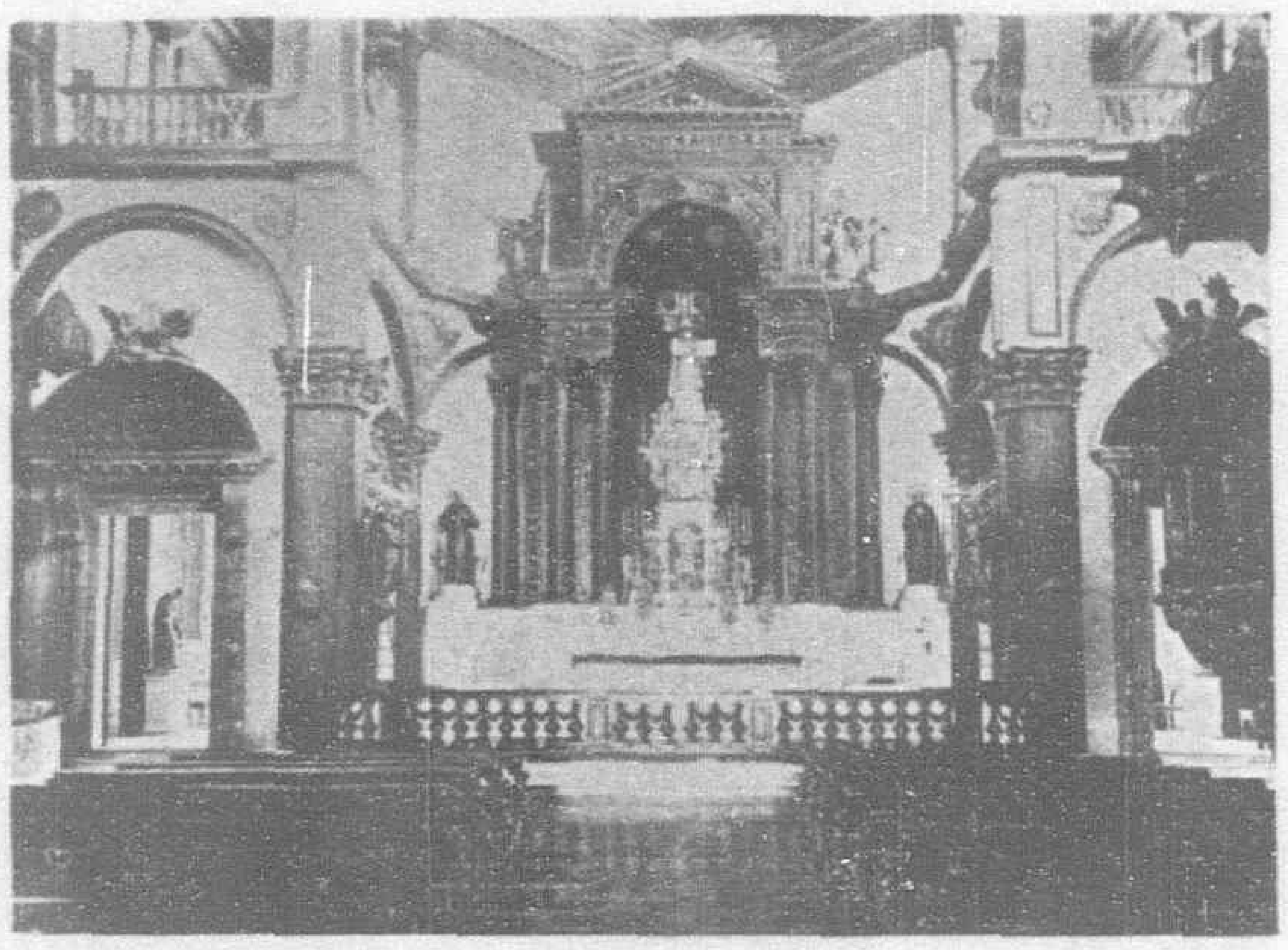
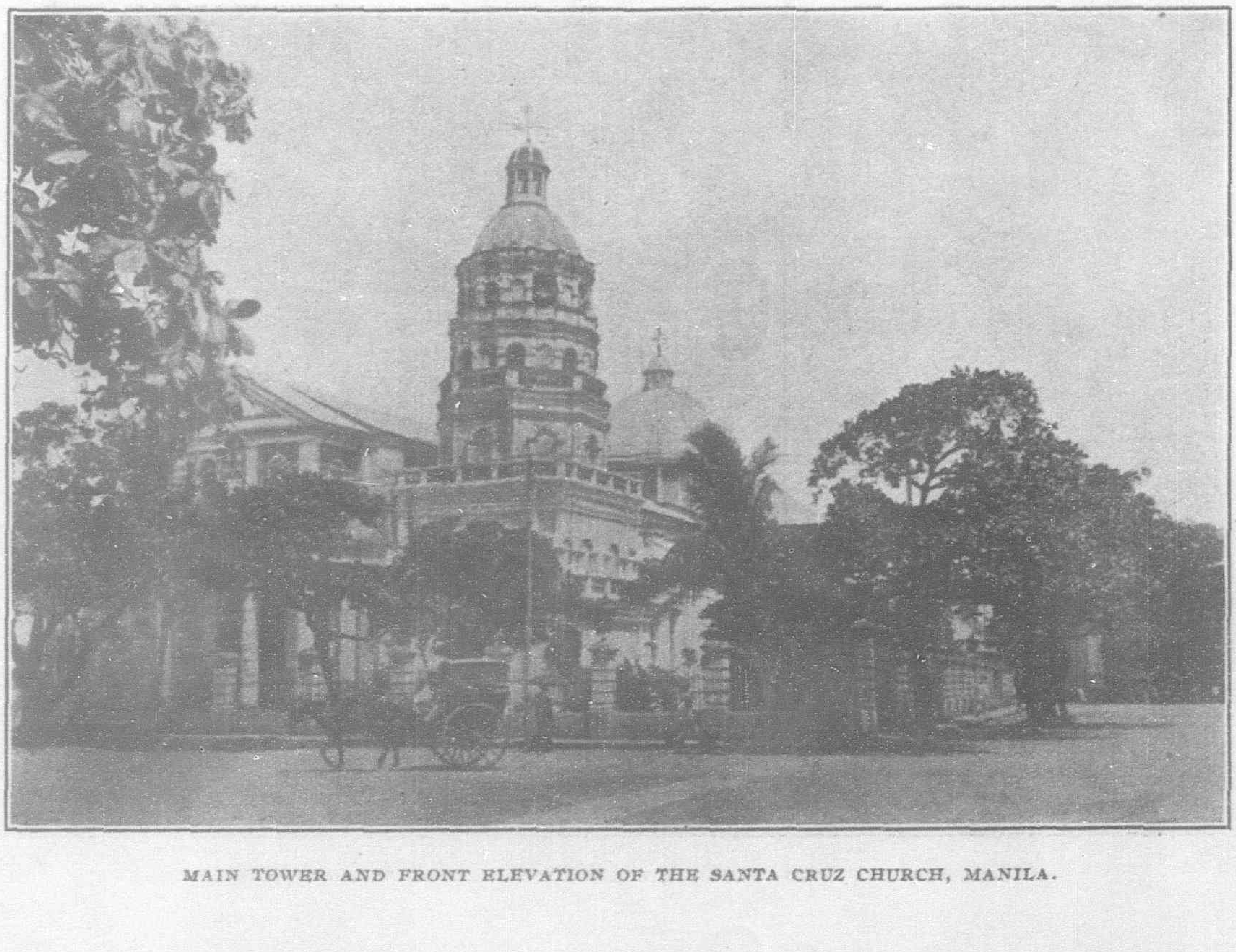


Photo by Squires, Bingham & Co., Manila.

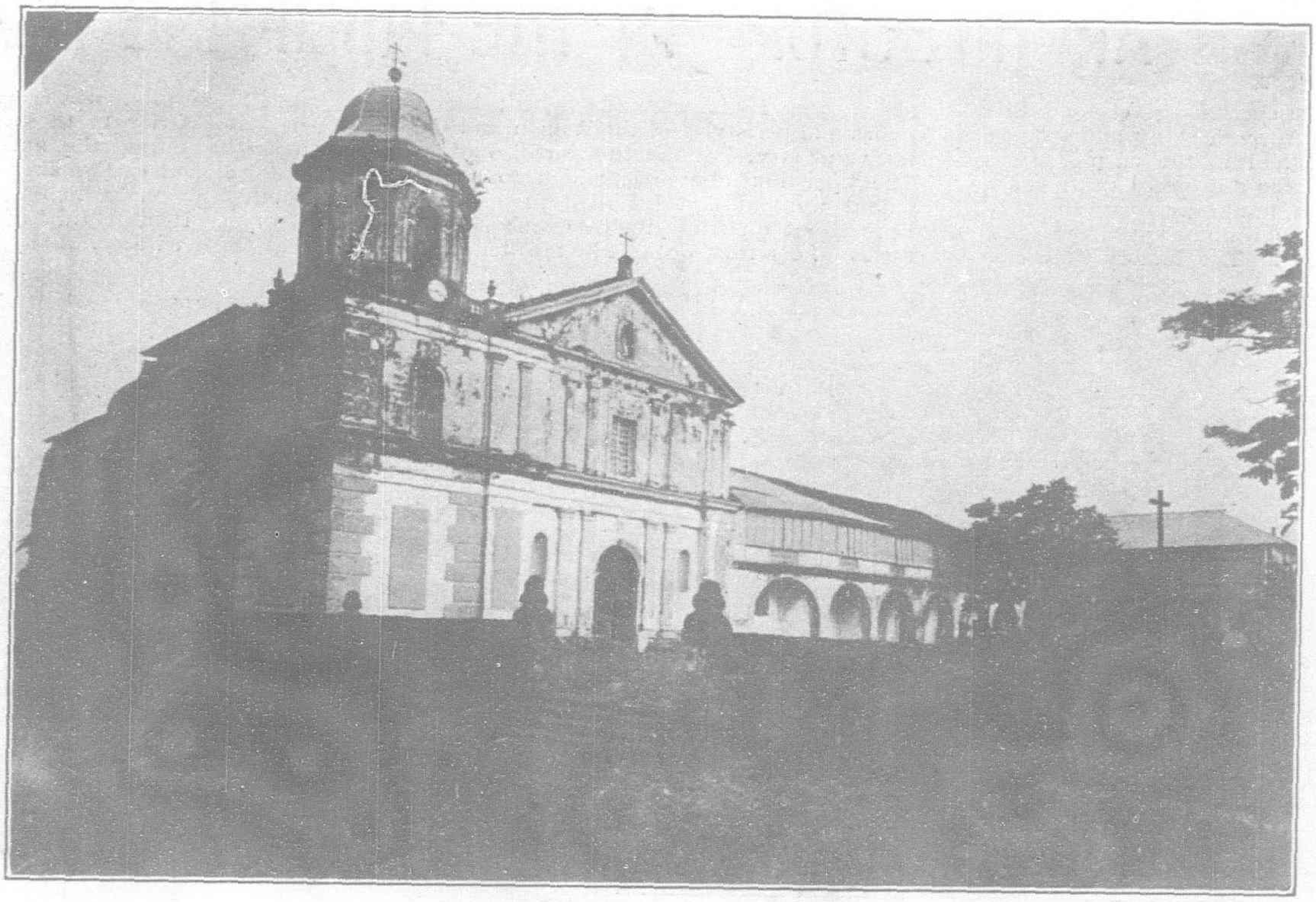
ALTAR SECTION OF MANILA CATHEDRAL.

The interior of the temples of Egypt, Assyria, and India were darkened; the porticoes and peristyles of the Roman and Greek lofty and airy, but the interior also obscure. The Christian churches, which to a certain extent were at first installed in abandoned, worked-out quarries, the catacombs, and centuries afterwards occupied the temples of pagan divinities, preserved this tradition of semi-obscurity and embodied it in all their future constructions, no matter what the particular style of architecture was.

Here in the Philippines the grand ruins of Asia and America are lacking. The monuments in existence here are of European origin. Built by Europeans, or under their direction, they all have the imprint of European art modified so as to adapt itself to the special conditions of a volcanic country. High structure with lofty towers and spires, sharp-pointed gothic arches are impossible here. Still architecture is not behind the times here and still less in Manila, whose churches are in no respect inferior to those of other countries, notwithstanding the unfavorable conditions, the frequent earthquakes and yet more frequent typhoons, which the builder has to encounter. It must further be borne in mind that these edifices, many of which cause admiration, are not the work of trained architects, who made a life study of their art, but the work of religious missionaries who, besides transforming the savage into a civilized being, found time to study the art and science of building, and had sufficient patience to raise, with the crudest material and labor possible, structures which are a monument to their intelligence. The friars were the great architects of the Philippine archipelago and most all the churches in the Islands owe to them their existence. The principal and main temple throughout the Islands is the cathedral of Manila. Its history is like the history of



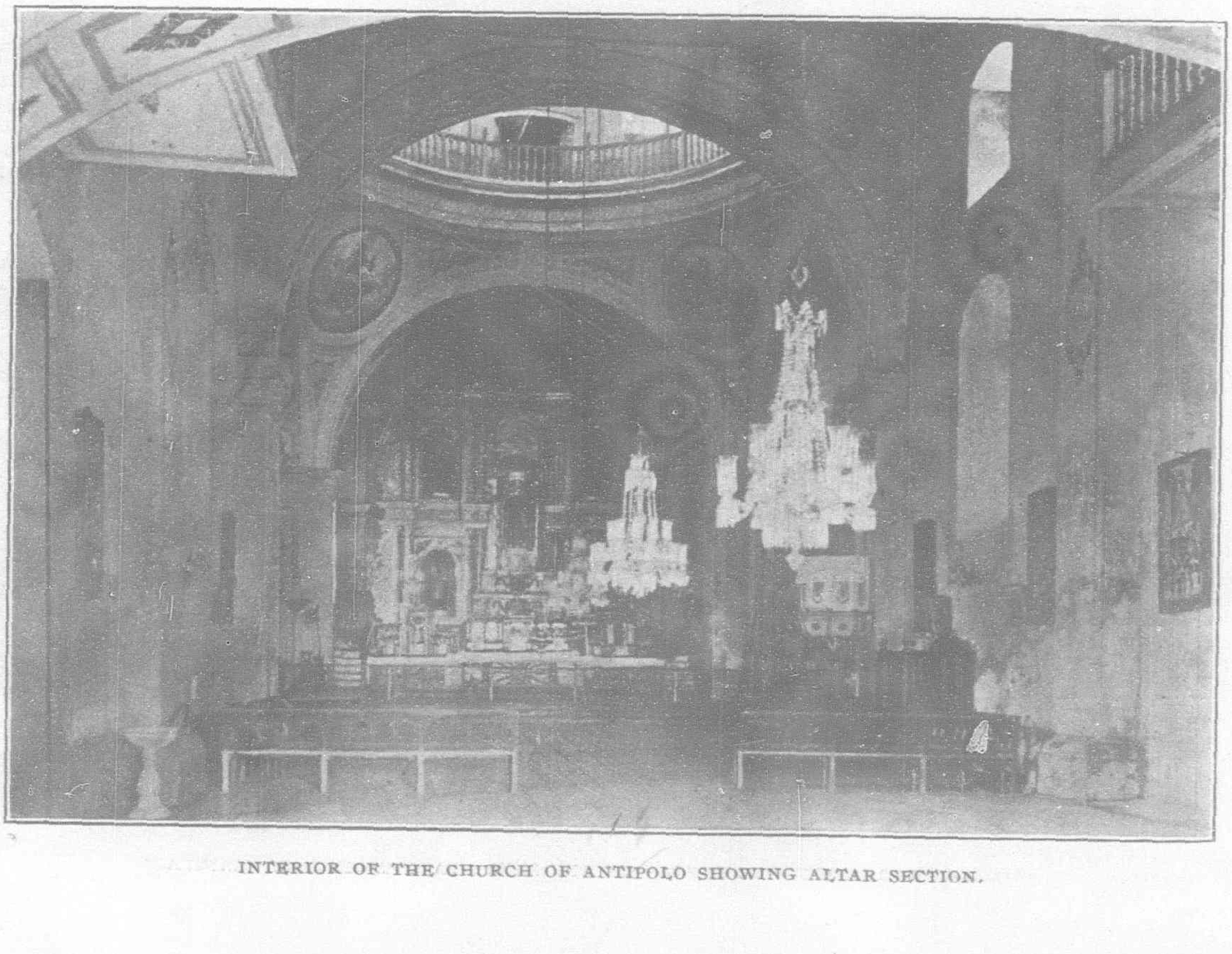
MAIN TOWER AND FRONT ELEVATION OF THE SANTA CRUZ CHURCH, MANILA.



FRONT ELEVATION OF THE FAMOUS CHURCH OF ANTIPOLO.

most all others—a humble palm-building in the beginning, then built of boards, later of stone; several times destroyed by earthquakes; finally rebuilt in 1614 only to be leveled to the ground again on November 30th, 1645; rebuilt in 1671 it lasted until June 3rd, 1863, when the sumptuous church was in a few short minutes turned into an inform mass of debris covering many a human victim. But soon forces were at work again to raise a new temple, money was forthcoming from all parts, and sixteen years later the present cathedral rose phoenix-like from its ashes.

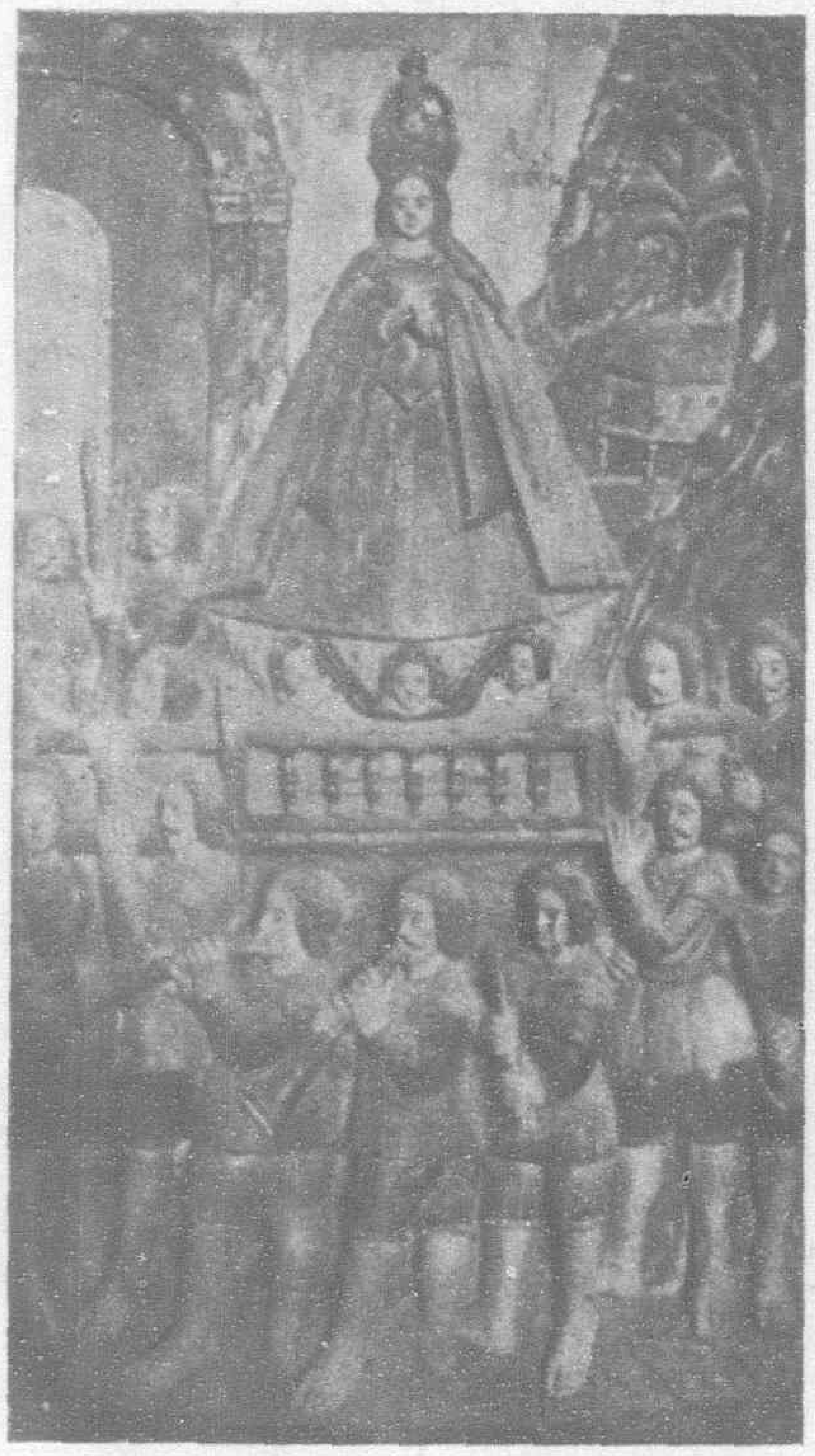
The facade of the cathedral has the severe and serious character, proper of the Byzantine style; but is subjected to the taste of modern architecture. The tall and elegant columns, the majestic arches, the great elevation of the central nave, the immense height of the cupola, recall the gracefulness of the old Roman temples. The beautiful Byzantine style, even if not exactly pure, appears in many places as in the details of the capitals, the decoration of the architraves, the entrances to the chapels and the windows of the galleries of the central nave. The painting which is done in fresco, with the exception of the four evangelists executed in distemper, follows the same Byzantine character adapting itself to the present taste. The construction in general has for its object to offer the greatest resistance possible to the frequent earthquakes which visit this part of the world. The four evangelists of the cupola are painted by Mr. Dibella; the interior of the chapels is the work of native artists. The stalls about the choir and the balustrade are of good taste, although modest and simple in design, in accordance with the climatological conditions of the country. With the exception of six, made in France, all are the work of the well-known Philippine sculptor, Mr. Isabelo Tampinco, and the wood employed is "molave." The image of the Immaculate Conception, the work of a Mr. Sales, is taken from a large photographic copy of the famous painting by Murillo which exists in the Royal Museum of Madrid.



INTERIOR OF THE CHURCH OF ANTIPOLO SHOWING ALTAR SECTION.

The cathedral is composed of three naves of five arches cut by a transept under the dome, of an apsis which embraces the main chapel around which the two lateral naves join in a semi-circular line, and of two passages with chapels and vestibules which extend along the lateral naves. The roofs of the naves are vaulted and all the subdivision arches double and rest upon groups of four columns which divide the three naves, and on pilasters arranged in pairs which project from the walls. The chapels are lighted by large windows; the lateral naves by oeils-de-bœuf, which correspond to the subdivision arches of these naves; the central nave and transept receive light through the large rose of the facade and the cupola by groups of three high windows in each of the fronts of the octagon.

VIRGIN PROTECTS SPANISH GALLEONS ON THEIR VOYAGES TO CENTRAL AMERICA.



SPANIARDS CARRYING THE VIRGIN FROM SEASHORE TO MANILA CATHEDRAL: YEAR 1662.

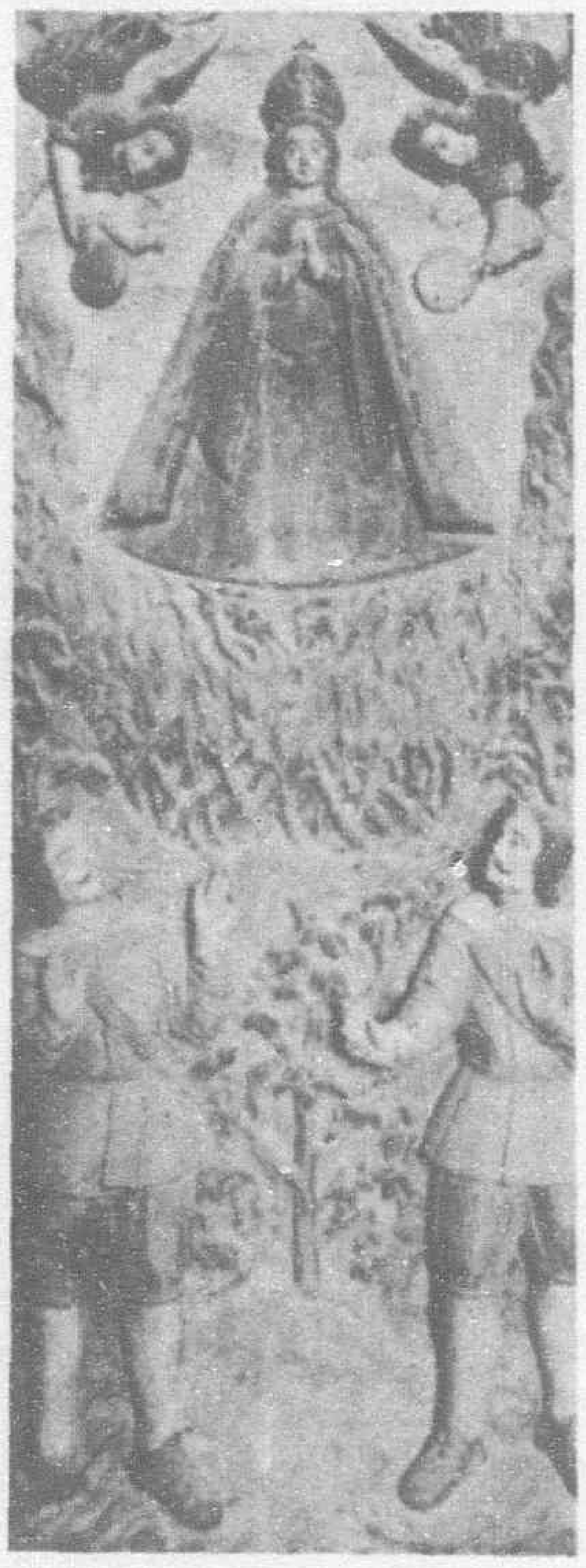
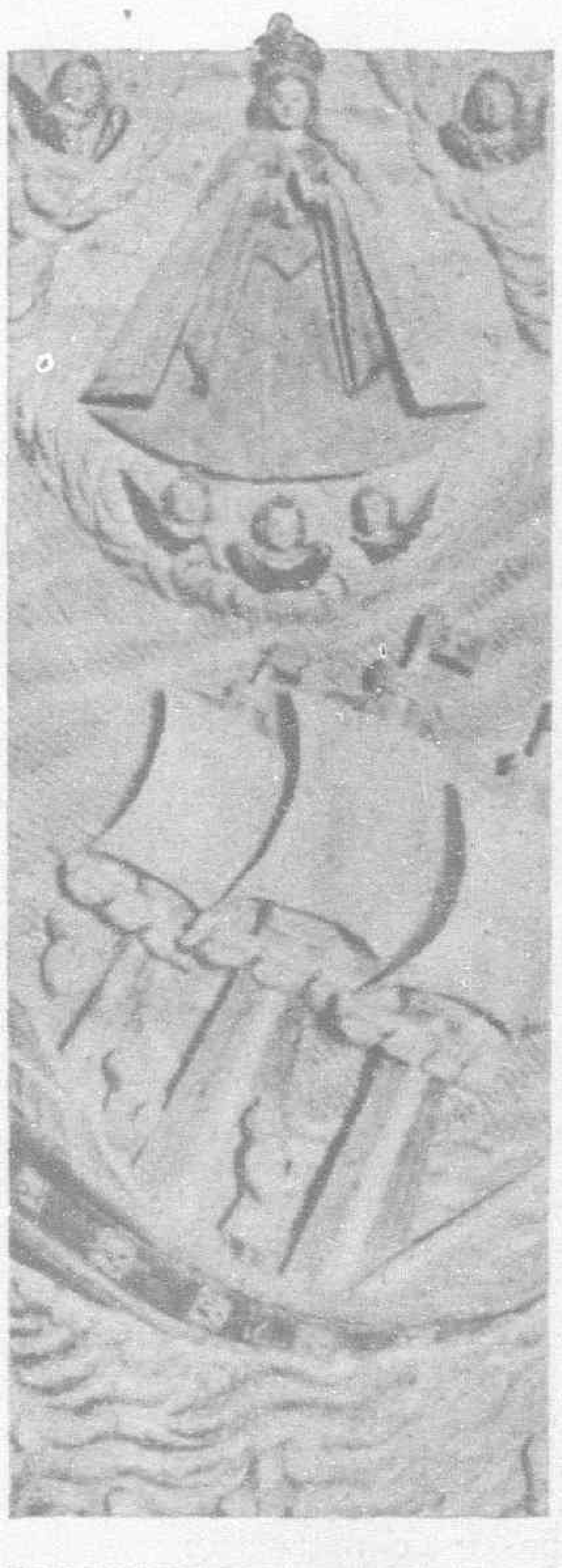
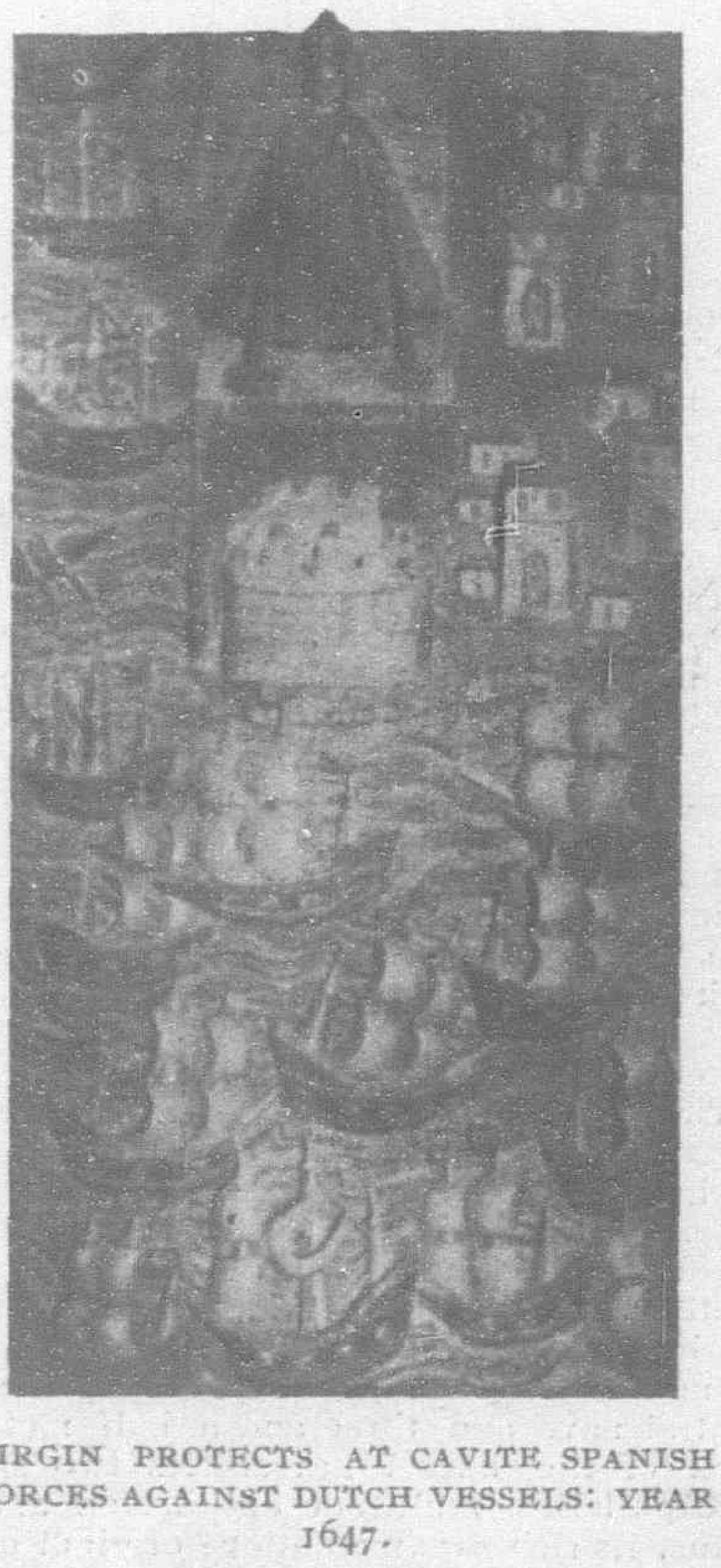


IMAGE WHICH HAD BEEN HURLED INTO FIRE BY CHINESE FOUND BY SPANIARDS UNDAMAGED.

SIX TABLETS OF STONE IN THE CHURCH OF ANTIPOLO WHICH COMMEMORATE GREAT INCIDENTS IN THE HISTORY OF THE IMAGE OF THE VIRGIN OF ANTIPOLO, OR "OUR LADY OF PEACE AND PROSPEROUS VOYAGES."

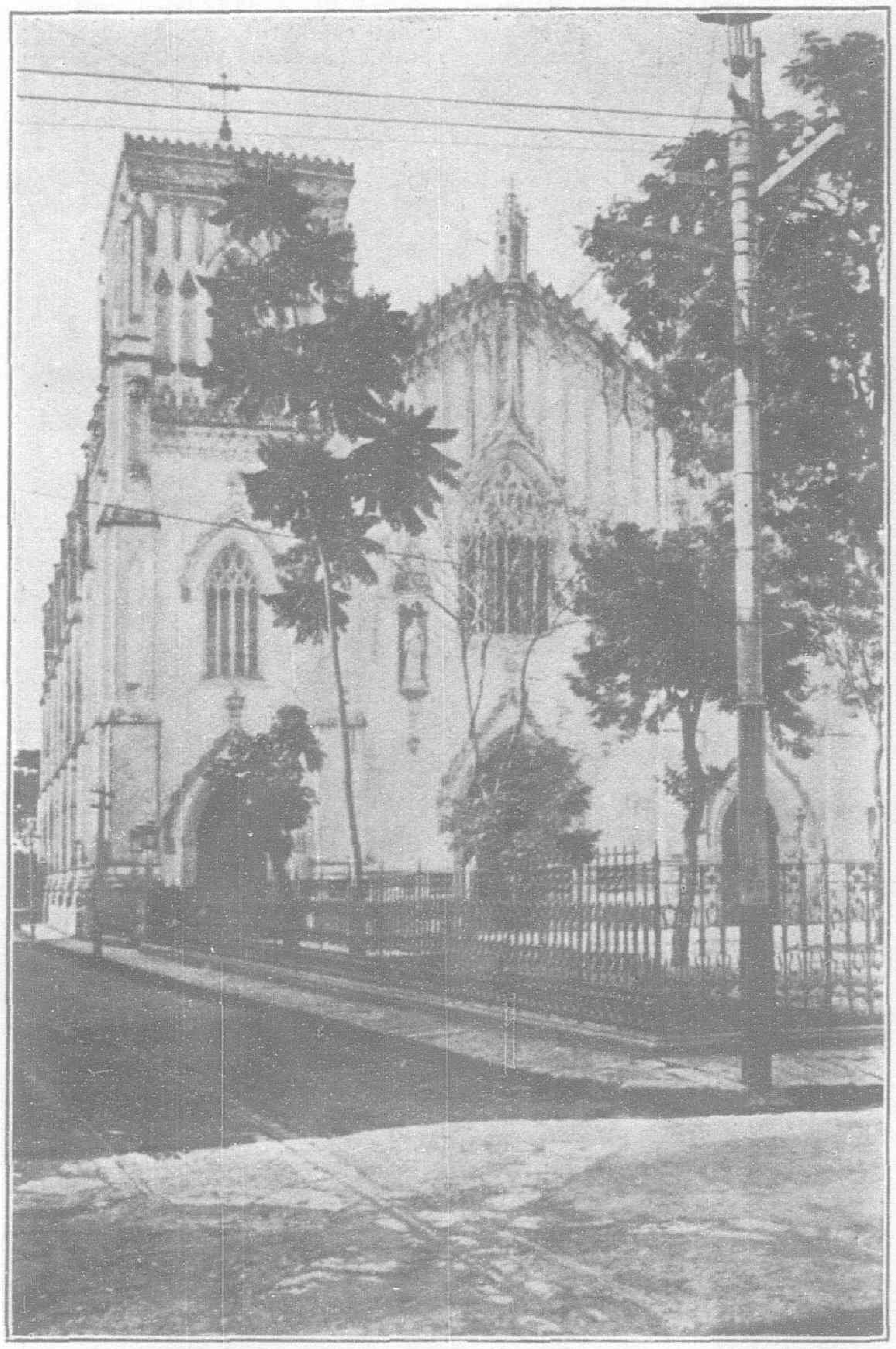


VIRGIN VISITS SHIPWRECKED MARINERS WHO INVOKE HER.

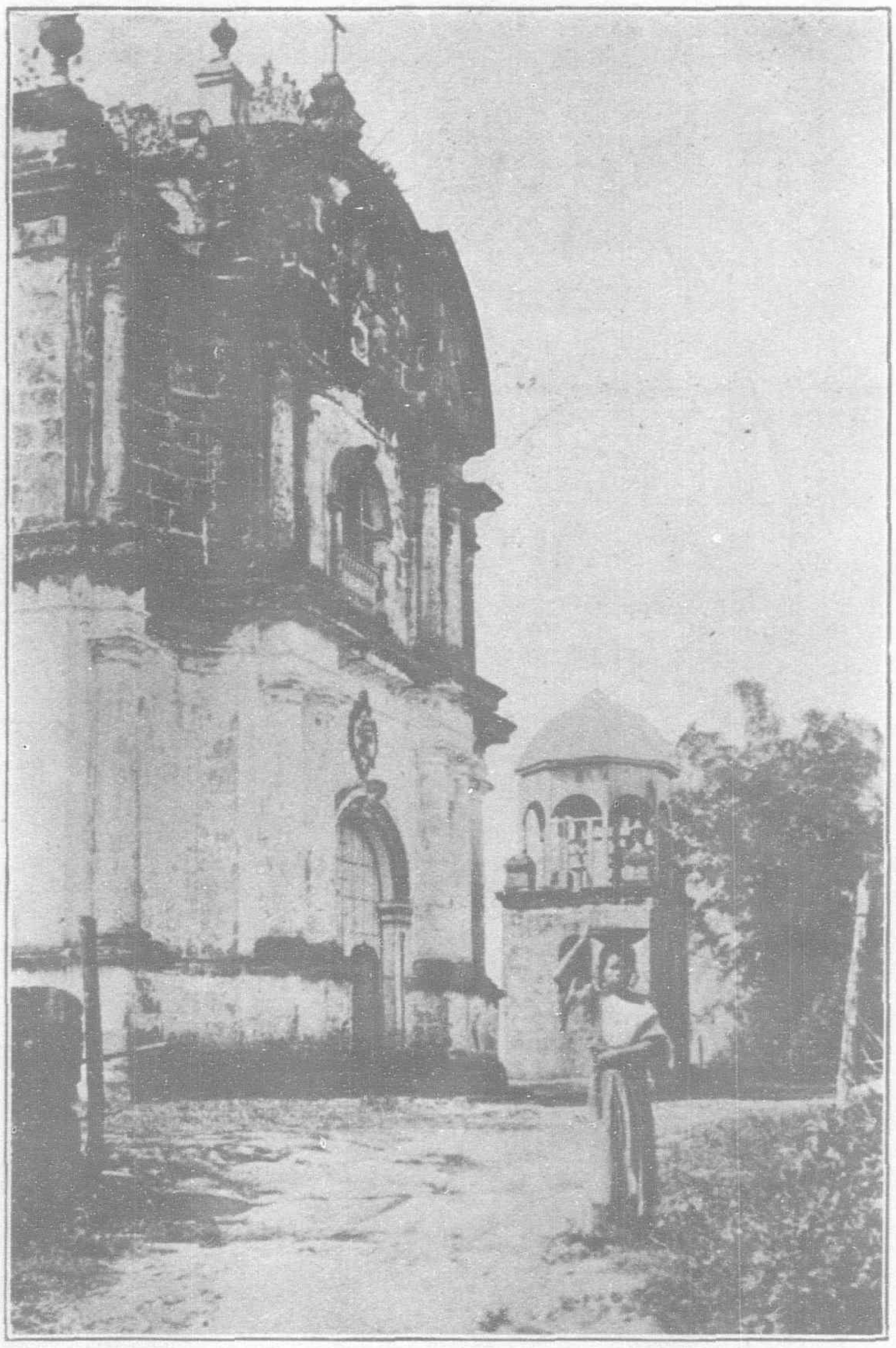


VIRGIN PROTECTS AT CAVITE SPANISH FORCES AGAINST DUTCH VESSELS: YEAR 1647.

CHINESE IN REVOLT PIERCE THE VIRGIN WITH THEIR SPEARS.



TEMPLE OF SANTO DOMINGO, MANILA.



FRONT ELEVATION OF CHURCH AT SAN PEDRO MACATI, SHOWING SEPARATE TOWER.

Joined to the apsides is a chapel of regular dimensions and rectangular form; there exist besides two other large chapels which constitute the parish church of the Walled City. The cathedral has nine direct entrances, three in the main facade, two in the central arch of each of the lateral naves, two in the extremities of the transept and other two in the absides. The chapel of Saint Peter and the one used as parish church have also separate entrances, so that in reality the building has thirteen doors, all large and distributed in such a way that its people, even in a panic, can easily reach an outlet. The material employed in the construction is granite—volcanic stones from Guadalupe and Meycauayan—marble, bricks, and iron. The roof of the naves and transept is of galvanized iron, and of the cupola, copper. The cost of the entire building amounted to $288,181.36⅝, of which the Spanish Treasury furnished $96,043.04, the local funds a like amount, and church fees and voluntary gifts $96.095 28⅝.

The work of rebuilding lasted from October 4th, 1872, until December 8th, 1879, when under the presidency of the very Rev. Fr. Pedro Payo, Archbishop of Manila, assisted by Bishops Cuartero and Garcia Ceson, the "temple was inaugurated and blessed in the presence of the King's representative, Don Domingo Moriones, Governor General of these Islands, and a numerous concourse of people representing all classes and races of this vast archipelago." At that time the cathedral had a tower, which was destroyed by the earthquake, which 40 minutes after midday of July 18th, 1880, visited the city of Manila. This was the last destructive seismic perturbation which was felt here. It laid in ruins parts of the city and caused great damage in the neighboring provinces.

A vast, imposing pile is the church and convent of Santo Domingo. Few Oriental cities have the glory of possessing such a magnificent group of buildings. Its strong walls, its massive towers, its gothic pinnacles and windows recall to the mind the ancient cathedrals of Europe, castle and church at the same time. The style of architecture is very nearly pure gothic. This enormous mass of buildings is built upon what was originally a swamp which Bishop Salazar bought for the Dominicans in 1587 for 300 pesos. The fathers who took possession of the land had to go there by canoe. And now it is one of Manila's greatest ornaments.

The Dominicans own and direct also another magnificent building, the College of San Juan de Letran, which was established June 18th, 1640. The large hall of this college is a master piece of architecture and the work of the lay-brother Fr. Augustin Roca. It is of pure Corinthian style with a half vault. The hall is 36 metres long by nine metres high in the central nave and three and a half metres in each of the lateral naves. Its two stories, side galleries, multitude of pilasters and columns, its rich ornamentation, original ceiling and beautiful floor, give to this hall an enchanting aspect, a mixture of sumptuosity and magnificence, extraordinarily rare here in the Farthest East.

Another building, although not of great architectural beauty but imposing by its size, is the University of Santo Tomas, founded in 1611, the alma mater of all the jurisconsults, theologians, physicians and mathematicians which the Philippines have produced.

An imposing structure, also the work of this order, is the church in Cavite the traveller sights shortly after he passed the channel of Corregidor. It is only of one nave, but superb; it is 87 metres long to the main altar, with a wide and elegant transept, and a tower strong and graceful at the same time thirty-two metres high.

The Franciscans arrived in Manila, June 24th, 1577, and built like all others their first church and convent of palm. In 1583 the flames devoured it. In 1602 it was built for the third time, and in 1739 it was replaced by the yet existing building. Its architecture belongs to the Toscan order, which is the model most of the Franciscan missionaries followed in building their churches. What attracts attention is the great thickness of the walls and the extraordinary fine timber employed in its construction, but notwithstanding this it suffered serious damages by the earthquakes of 1824, 1863, and 1880. The convent is also of massive construction and ample dimensions and enjoys the well-merited honor of having had the first apothecary shop in the Philippines.

Close to Saint Francis is the Church of the Third Order, built in 1733. It is also of a simple style, but boasts of two graceful towers.

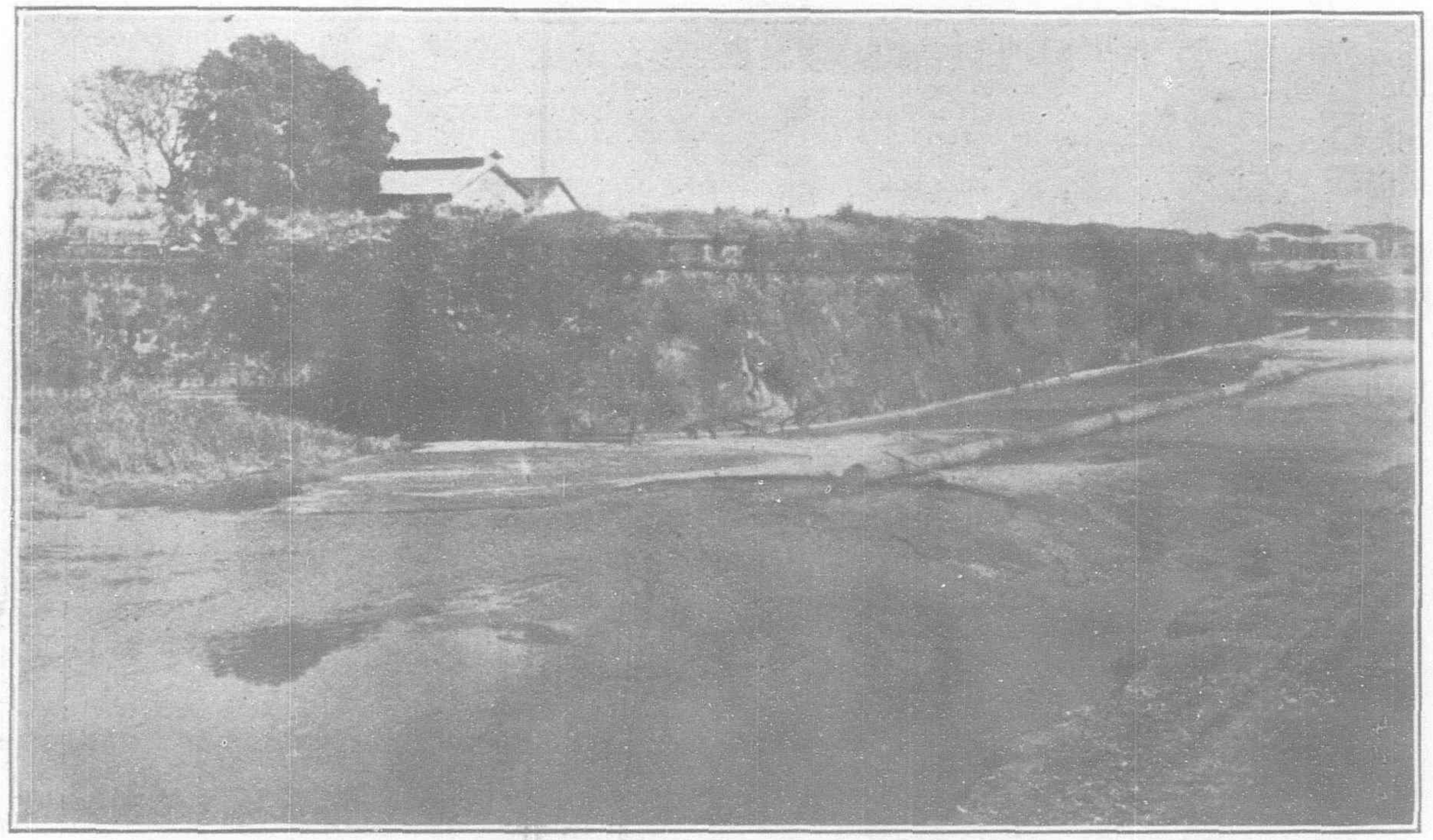
TOWER AND FRONT ELEVATION OF THE CHURCH OF TAYTAY, BURNED DURING THE INSURRECTION IN 1899.

A magnificent group of buildings is formed by the church, convent, and offices of the augustinian order. This church is the oldest in all Manila, built first on June 24th, 1571, destroyed by fire on February 28th, 1573; the work of reedification was begun in 1599 and finished in 1614 The first architect was Juan Macias, who succeeded the famous Austin lay brother, Fr. Antonio Herrera, the son of the celebrated architect to whom Spain and the rest of the civilized world owe that unique monument, the Escurial, palace and monastery at the same time. The church is of the most solid work, of three naves, of Corinthian and Ionic order and has eight chapels. It is the only one in the entire archipelago whose vault is all of hewn stone. It contains the tomb of Legaspi who died Aug. 20,1573, and of Salcedo.

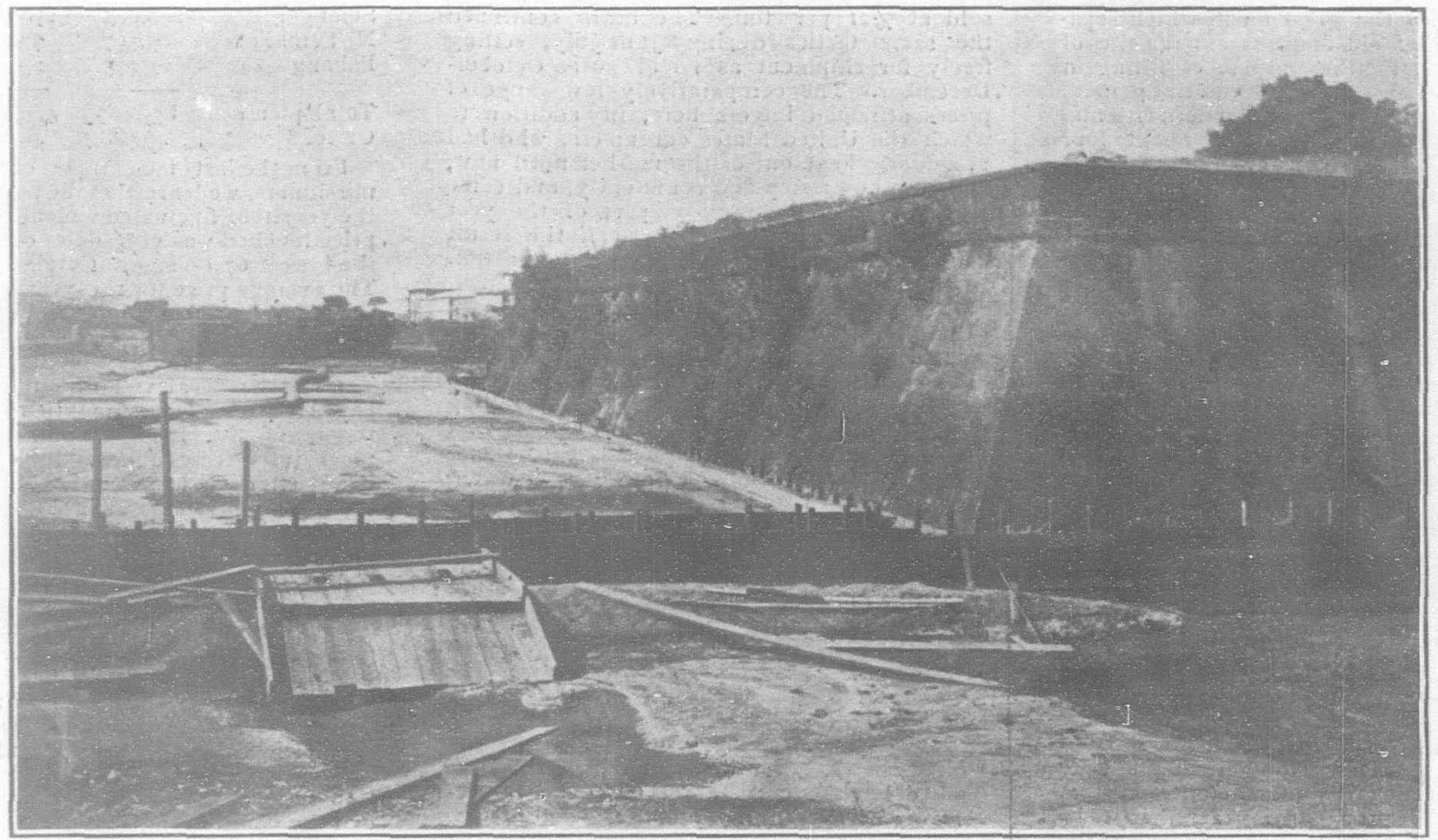
The church and convent, which is also of great strength and much architectural merit, cover an area of 21,212 square metres. Both buildings without suffering very serious damages have resisted the horrible and destructive seismatic phenomena of 1645, 1754, 1852, 1863, and 1880. The Order erected in 1895 the ample and artistic office building on Palacio and Arzobispo streets, which is joined to the old convent by a bridge. The same Fr. Antonio Herrera who superintended this work is also the builder and architect of the church and convent of Guadalupe, now in ruins, the foundation whereof was laid in 1601. As well the church as the convent are of solid construction, and the vault of hewn stone which resisted all the earthquakes, even the one of 1880, is of great merit. This vault fell in owing to some of the abutments, which on the outside imparted great solidity to the church, having been destroyed, but all these defects were remedied by the very Rev. Father José Corugedo in 1882. The interior of the church is of the Doric order, and it was formerly celebrated as the shrine of the Virgin of Gua-

(Concluded on page 27.)

RUINS OF THE INTERIOR OF THE CHURCH OF TAYTAY.



FILLING GREAT MOAT AROUND WALLED CITY WITH MATERIAL DREDGED FROM THE BAY BY ATLANTIC, GULF AND PACIFIC COMPANY'S HYDRAULIC DREDGE.



ANOTHER VIEW OF MOAT IMPROVEMENT, SHOWING TEMPORARY SEWERAGE CANAL.

(Continned from page 14.)

At first the company experienced difficulty in securing sufficient native labor to equip the quarry up to the demands of the harbor work. This was due to several causes. In the Spanish days the Filipinos who worked at these quarries had trouble in getting their wages. Very naturally this made them suspicious of the good faith of the Americans. They did not want their former experiences duplicated, but as soon as it was demonstrated to them that they would receive their wages when due, this scarcity of labor disappeared as if by magic, and the supply of labor soon became greater than the needs. In fact, the Atlantic, Gulf and Pacific Company has been most successful in getting all the native labor it has required on any part of the harbor work, and this because it has dealt fairly with the Filipinos and kept faith with them in every promise it has made.

At Sisiman the quarry workers have been well fed and housed. They have had their own church and a schoolhouse for their children,a native doctor to look after their physical ailments and a Filipino priest to minister to their spiritual well-being They have a band made up from among their number, a cockpit and dancing for recreation. To handle native labor successfully the Atlantic, Gulf and Pacific Company has learned that high grade white foremen are a necessity, and this class of Americans has directed the work at the quarry.

All of the breakwater built by the Spaniards was of small brown stone brought from the Laguna country, while under the American construction this material has been brought in barges, propelled by powerful tugs, from Sisiman. Larger stones have been employed in the construction, many of them weighing more than 16 tons apiece. The Atlantic, Gulf and Pacific Company for months took out of the quarry an average of 50,000 tons of stone per month, which has been promptly delivered to the breakwater builders. In addition to the quantity of stone deposited by the Spaniards, there have been utilized on the construction of the west breakwater over 250,000 tons of rip-rap rock, besides about 10,000 tons of rubble masonry and more than 5000 yards of concrete coping. Along the bulkhead there has been placed 300,000 tons of rock and it is estimated that for the completion of the additional breakwater over 50,000 more tons of stone will be required, more than 400,00 tons having already been utilized in this part of the work. In all probability the supply of stone for this portion of the improvement will considerably exceed the original estimate.

The cost of the harbor improvement will be considerably in excess of the original estimates. The amount paid by the Insular Government to the contracting company, to date, is -P-4,853,877.88 and -P-245,720.58, making a total of -P-5,099,598.46 or $2,549.796.23 U. S. currency. The estimate of rock is very largely exceeded, the west breakwater requiring something like 81,000 tons more than the estimate provided for, and the bulkhead over 150,000 tons more. The dredging itself also is exceeding the estimated amount.

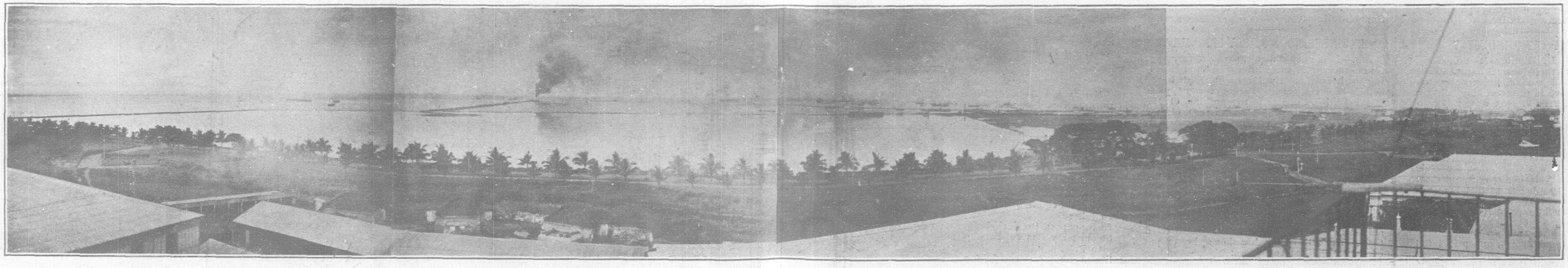
In form, the western breakwater is a rubble mound to low-water mark, having a slope of 1 on 2 to 1 on 3 on the exposed side, and 1 on 1 on the harbor side. Upon this rubble mound is built a masonry structure with concrete coping over that portion which has been built by the American Government, and granite block coping over that portion completed by the Spaniards. This superstructure has a height of 11 feet above low-water line and the whole work is further protected by rip-rap to an elevation of 6 feet above low water line on the exposed side. The additional breakwater is an immense stone pile, having a height of 8 feet above low-water. The breakwaters protect the shipping against waves coming from the Cavite side of the bay around to the north, while on the other or south side the waves have but a small sweep.

During the construction of the works Major Townsend and the contracting company have had some very difficult engineering problems to overcome. A number of breaks have occurred in the bulkhead from time to time which have necessitated the strengthening of this work very considerably. Considerable trouble has also been experienced on account of the softness of the soil reclaimed from the harbor. It is a stiff mud occasionally mixed with shells, and numerous borings taken show that the character of the soil at the bottom of the harbor is the same to a depth of over 117 feet, the maximum boring recorded. The foundations of the walls of the breakwater have sunk into the mud at least 24 feet, but Major Townsend is of the opinion that the settlement of the works has, finally, pretty generally ceased. The reclaimed dock area is drying out with extraordinary rapidity, although Major Townsend expresses the belief that the time will never come when it will be safe to build immense structures upon the reclaimed land without giving them a foundation of piling. The same obstacles to building upon this ground will be experienced as have had to be overcome along the Escolta and other low parts of the city in the past, where the foundation between bedrock many feet below and the surface is swamp soil.

The opening to the harbor between the west breakwater and the additional breakwater has been left tentatively 719 feet at mean low water. This width is somewhat greater than the opening given to harbors several years ago, but not as wide as openings to some of the harbors more recently built. The problem of width is a difficult one for the engineers to solve, as the owners of large vessels desire a large opening for easy entrance of big craft during storms, while the owners of smaller vessels much prefer a narrow entrance so as to have a quiet harbor. Therefore, the question of width becomes one of compromise and has to be settled in the hereafter with a view to the best interests of all concerned. It will be an easy matter for the Gorvernment to close in the entrance at a later date, should such extension of the improvement be deemed necessary.

There is yet considerable more dredging to be done in the harbor and the additional breakwater must be finished off from the low-water line up. This breakwater is to have a natural slope of rock as deposited, to a plane of 12 feet below low water on the side exposed to wave action. Above this plane the slope will be 1 on 2, and on the harbor side a slope of 1 on 1 extending to a height of 8 feet. The additional breakwater is composed very largely of stone, many of the single pieces being over 10 tons in weight, and above low water the material is carefully laid to slope.

At the present time the Insular Government is trying to assist the Atlantic, Gulf and Pacific Company to solve the problem of the disposition of the dredgings which are yet to be taken from the harbor to complete the work of deepening the latter, less than one quarter of the water area still remaining to be worked. The reclaimed area having been completed, it is still necessary for the contracting company to dispose of a large quantity of soil. About 1,000,000 yards of the surplus is now being pumped through the discharge pipe of



PANORAMIC VIEW OF MANILA BAY SHOWING HARBOR IMPROVEMENT AND RECLAIMED AREA 190 ACRES IN EXTENT.

the dredge into the great moat which separates the walls of old Manila from the site of the newer city, for the purpose of filling in this excavation as a step towards the general improvement of the city into a modern Oriental metropolis. It is estimated that about four months will be required to complete this improvement and fill in the outer ditch of the moat to the level of the Bagumbayan and Malecon drives, as the plans call for. The moat accommodates all the drainage of the Walled City, and to take care of this water and carry off that arising from the filling-in process it has been necessary to construct a timber bulkhead a distance of 3 feet from the walls and around the city to provide an open drain into which the water can flow until the new sewer system, the construction of which will soon be commenced, is installed, after which the bulkhead will be removed and the space filled level with the rest of the moat. Just now the big pipe from the dredge out in the harbor is discharging at a point near the Legaspi monument, on the Luneta, the mud and water spreading out towards both the temporary City Hall and Fort Santiago at the delta of the Pasig River, where a retaining wall has been constructed across the moat. After the moat has been filled to the desired level and the new-made ground is sufficiently dried out to warrant progress the artificial mounds which were heaped up by Spaniards for defense against the artillery of probable invaders, will be levelled off, and then the space between the walls and the drives will be ready for further improvement according to whatever future plans the city may adopt towards beautifying the metropolis.

What disposition will be made of the remainder of the dredgings from the harbor is as yet problematic. If the authorities finally decide to build the proposed esplanade or bund along the Luneta Beach to Malate, which is now under serious contemplation, the dredgings will in all probability be turned into that improvement. Already the Atlantic, Gulf and Pacific Company has taken 4,700,000 cubic yards of soil out of the harbor, with a total of 6,500,000 cubic yards to be disposed of to complete the deepening of the harbor. After the 1,000,000 cubic yards have been turned into the moat there will remain only about 500,000 cubic yards of excavation to be transferred elsewhere.

Major Townsend speaks in the highest terms of the efficiency of the staff of the Atlantic, Gulf and Pacific Company which has conducted the company's end of the harbor work. The relations between the Government and the company, and between Major Townsend as engineer-in-charge of the improvement, have always been cordial and without the least friction. Work has gone on uninterruptedly, with the exception of a few intervals when the elements interfered, and on every occasion the company has proved itself equal to all demands which the work as it progressed made upon it. The thoroughness of the improvement reflects equal credit upon Major Townsend's engineering ability.

RESUME OF HEMP INDUSTRY

Messrs. Walter H. Hindley & Co., Ltd., London, write in their annual report:—The confidence inspired among holders by the steady upward move in prices of Manila hemp during the second half of 1903 was still conspicuous at the commencement of 1904; the large deliveries to the trade in 1903 (showing an increase in round numbers of 30 per cent upon those of 1902) were expected to be continued upon the same scale in 1904, whilst in some quarters it was stated that the scale of receipts in Manila during 1903 would show a diminution in 1904. But neither here nor in America did consumers show any inclination to continue buying, and, despite the statistical position, a reaction set in; current quality and the grades below were freely offered for forward shipment, and prices fell during February and March until fair current stood at £34 per ton; then it rose to £36 10s., but by early June the value of current quality touched £32, whilst low brown hemp sold at £21 per ton. The bears continued the same tactics during June-July, selling freely for shipment as far ahead as October-December. The comparatively low range of prices attracted buyers here, in addition to which the United States consumers, who had practically kept out of the market until now, began to buy freely and confidently, and some of the bears of the early part of the year joined the ranks of the buyers, the result being a sharp advance of £4 10s. per ton. After a temporary relapse, buying in August, both here and in the United States, became general, and from then until the end of November a phenomenally large business was put through at gradually rising prices, the value of current quality at the close reaching £43 per ton. It is worthy of notice that the United States markets had run themselves so short of hemp for immediate use that large purchases were made by them for shipment from the United Kingdom, despite the fact that they lost thereby the rebate of 30s. per ton duty received upon direct shipments from the Philippines. By keeping their level of prices £2 to £3 per ton over ours, they also attracted from the Philippines the pick of the market as regards qualities and marks suitable for their use. Another feature to be noted is the increasing favor which the lower and coarser grades have met with in the United States, several thousand bales of Daet quality having been absorbed by them recently. Fine spinning qualities, as in 1903, were exceedingly scarce for the greater part of the year, and those marks which were selling at about £50 per ton in January were finding buyers during the summer months at £58 to £60 per ton, and occasionally higher still. In November-December, however, the supply of these grades has increased considerably.

JAPAN'S TINNED-FOOD INDUSTRY

One of the newest industries in Japan is the tinned-food trade, which supplies but a small demand for home consumption, and a limited export trade, says *The Japan Chronicle*. Consumption abroad is chiefly confined to Japanese, the article up to recently having no market among foreigners. This country is very rich in marine produce, and it is believed that if the quality of tinned fish in Japan were improved to the taste of foreigners a demand would be created, and an export trade might be rapidly built up. It was some time ago decided to can sardines, and experiments extending over some years were made by the department of the prefectural government of Aichi prefecture which superintends marine produce. The department has now succeeded in producing sardines in oil of excellent quality, and sales were lately tried in America and Australia with excellent results, orders being received for large quantities. A few months ago a company was organized in Nagoya, with a capital of -Y-100,000, to develop this industry, and to-day the output of the company does not keep pace with the demand from abroad.

ENGINEERING IN MALAY PENINSULA

Tin.—It is very difficult, says *Engineering*, for engineers and those interested in engineering to keep themselves acquainted with the details of developments in the various parts of the British Empire, to say nothing of the countries of the world; but it is absolutely necessary for success in almost every department of business to follow the main lines of evolution in all parts of the world. The Malay Peninsula is rather apt to be overlooked as being intermediate between India and the Far East; still it is of considerable importance not only on account of its geographical position, but also because of its productions and its engineering developments. The fact that it is the most important centre for tin production should in itself cause attention to be directed to it. The following table shows the output of tin for the last/two years:

	1903, piculs	1902, piculs	Increase. piculs
Perak	436,370	405,878	30,593
Selangor	292,665	278,368	14,297
N. Sembilan	85,597	73,511	11,986
Pahang	25,275	23,114	2,161
Total piculs	839,807	780,871	58,936
Or tons	49,988.5	46,480	3508.5

From the last official report of the High Commissioners, we learn that the price of tin during the year 1903 fluctuated violently. The highest price touched was 98¾ dols. on March 3, and the lowest 67 dols. on October 1, per picul. The average price for the year was 83.65 dols. per picul, being 4.29 dols. higher than in 1902. The average rate of exchange during 1903 was 1s. 9d. and a fraction, and in 1902, 1s. 8¾d. The sterling local value for tin for 1903, was thus 122*l*. 10s. per ton, and in 1902, 117*l*. The report of the High Commissioner contains much interesting information on the Chinese labor question (for in the Malay Peninsula native labor is as scarce as in the South African Rand), but for details on that subject we must refer to the report itself. Of the total output of, say, 50,000 tons, only 700 tons were got from lodes, the remainder being got from rich alluvial deposits by hydraulic methods. Owing to fluctuations in the dollar price of tin, trouble with the labor force, the increased cost of working, the small capital with which Chinese miners frequently embark upon their enterprises, the high rates of interest charged by the chetties for accommodation, the exhaustion of much of the more easily worked land, and the delay attending the alienation of new land, the year was not a satisfactory one, on the whole, for the miner. The methods of working seem to be very primitive, and in the report it is urged that the Government ought to turn its attention to a study of modern scientific methods of mining and oredressing, which are successful all over the world, and to training its own officials and the European and the Chinese miners in economical and efficient working.

Gold Mining.—In regard to gold mining, there is not very much to report at the present moment. The following figures give the results for the year at the principal gold mines now working in Penang:

Mines.	Tons Crushed.	Ounces Won.
Raub Australian Company.	32,570	7,078
Malaysian Company.	8,314	2,854
Kechau Gold Fields.	1,931	469

Post Office and Railways.—The Departments of Posts and Telegraphs in each of the States, including telephones, money-order business, and savings banks are important branches of the Government service, and the need of uniformity of administration under one head is obvious and pressing.

The States Railways were formed into a federal concern from the beginning of 1903, with Mr. C. Edwin Spooner as general manager, and the work was carried on with energy and success. The mileage of the different sections of the open line, exclusive of sidings, is:

	Miles.	Chains.
Province Wellesley	23	7
Perak	189	70
Selangor	108	
Negri Sembilan	19	
Total	339	77

It may now be said that a through line of railway from Penang Port to Singapore Port is in sight. The total mileage of such a main trunk line, exclusive of branches, would probably be 492 miles 55 chains, made up as follows:

	Miles.	Chains.
In Province Wellesley	23	7
In Perak	165	48
In Selangor	81	0
In Negri Sembilan and Malacca	83	0
In Johore	120	0
In Singapore (to docks)	20	0
Steam ferry service Penang to Prai, 5 miles	5	60
Steam ferry service—Johore Straits, ¾ mile		
Total,	498	15

CHURCH ARCHITECTURE IN THE PHILIPPINE ISLANDS

(Continued from page 23.)

dalupe, whose original image had been brought from Extremadura in Spain. The present image, of much artistical value, is the work of two religious. Both buildings were devoured by flames in March 1899, when the American troops attacked the insurgents who had fortified themselves there. The archives perished in the conflagration, and among the many valuable books, documents, and manuscripts, a large number of copies of the "Flora de Filipinas," by father Blanco, besides numerous other objects of value.

The doors of the San Augustin church in Manila merit special attention for their artistic and excellent carvings as do also those of Santo Domingo.

The first church and convent of the Recoletos were located on Bagumbayan and the present ones were built at the beginning of the 17th century. The church, although not a specially beautiful monument of architecture, is very sumptuous, and from the convent a fine view towards the south is obtained.

Those who were in Manila up to 1901 must remember yet the ruins of a church on the corner of Palacio and Victoria streets, of which only part of the facade remained. This was the former Jesuit church, the most magnificent of all, but also a victim of the great earthquake of 1863 and now only a memory. This temple of collosal proportions had cost more than 150,000 pesos. It was a masterwork of the most classical architecture, and the delicate stone work resembling embroidery was the admiration of the entire Far East. The present Jesuit church is of fine proportions, but as is to be expected of absolutely modern style, a perfect "bijou," pleasant to look at, but not inspiring the profound respect of the former magnificent edifice.

Another beautiful church has disappeared since the English besieged Manila, the Hermitage of Our Lady of the Guide, which has given the name to actual Ermita. Tradition says that it was the first Catholic chapel erected in these Islands and in it was venerated an image of Our Lady found by a soldier of Legaspi in a palmgrove of the site called Pandan. The modern church is of little architectural merit. The primitive church of Malate was built in 1566 and served as headquarters for the English forces during the siege of Manila.

Binondo church is beautiful with its two naves and facade of the Doric order with three doors leading out to the square. The tower is formed of several bodies, diminishing in size. Until 1839 it had a far larger open space which reached clear to the end of Rosario street, comprising the former Oriente Hotel, the Insular Cigar Factory and a large part of the present park.

Santa Cruz church was built by the Jesuits, and the present rectory is only a small part of what was then the College of San Ildefonso. The construction, although of no architectural beauty, is very solid, with thick walls and large windows towards the square. It has three main entrances.

Quiapo has a church of three naves, with a tower and two doors leading to the square and one giving access to the vestry.

Out at San Sebastian stands one of the best, if not the best example of modern gothic architecture in the Orient. Bodily has this beautiful piece of work been transplanted from the banks of the vine-clad Rhine to the palm groves of Luzon. Its lofty, capricious spire recalls vividly to the mind the graceful lines of the church towers so frequently made in Southern and Middle Germany. The entire building is of iron and steel, was built in section in Germany, shipped to Manila and put up here as it stands today.

Churches of little, if any, architectural importance are those of San Miguel and Sampaloc besides a number of chapels more or less large scattered throughout the city.

The oldest of all buildings in Manila is Fort Santiago. It is built on the site of the fortress taken by the Maestre de Campo Goiti, in May, 1570. The same year saw the inception of the fortress which was then only of timber, but about twelve years later the sixth Captain General, Dr. Don Santiago de Vera, changed the timber of the fort into masonry and raised the first stone wall. Gomez Dasmariñas brought orders from Spain to push the work forward and this was done shortly after his arrival in 1590. The fortifications were continued for many years and in 1644 Don Diego de Fajardo completed the first bastion, which was named San Diego, and work on the walls was never stopped until about the middle of the 19th century.

Santiago has a perimeter of 2030 feet and its form is very nearly triangular; at Dasmariñas time it was a castellated structure, without towers, trapezoidal in trace, its straight gray front projecting into the river mouth.

As stated, excepting Fort Santiago, a small part of the walls, and the church of Saint Augustin, little, if anything, is left of buildings of the first century of European occupation. It is in vain to seek for the ruins of monuments prior to the Spanish conquest, for the natives had absolutely not the slightest knowledge of the art and science of building, being in these respects far behind the inhabitants of Mexico, Central America, Colombia, Ecuador. and Peru, where the Spaniards found kingdoms, cities, and towns which astonished the conquerors by their magnificence and splendor.

VIEW OF THE OLD CHURCH AT PASIG, NEAR MANILA.

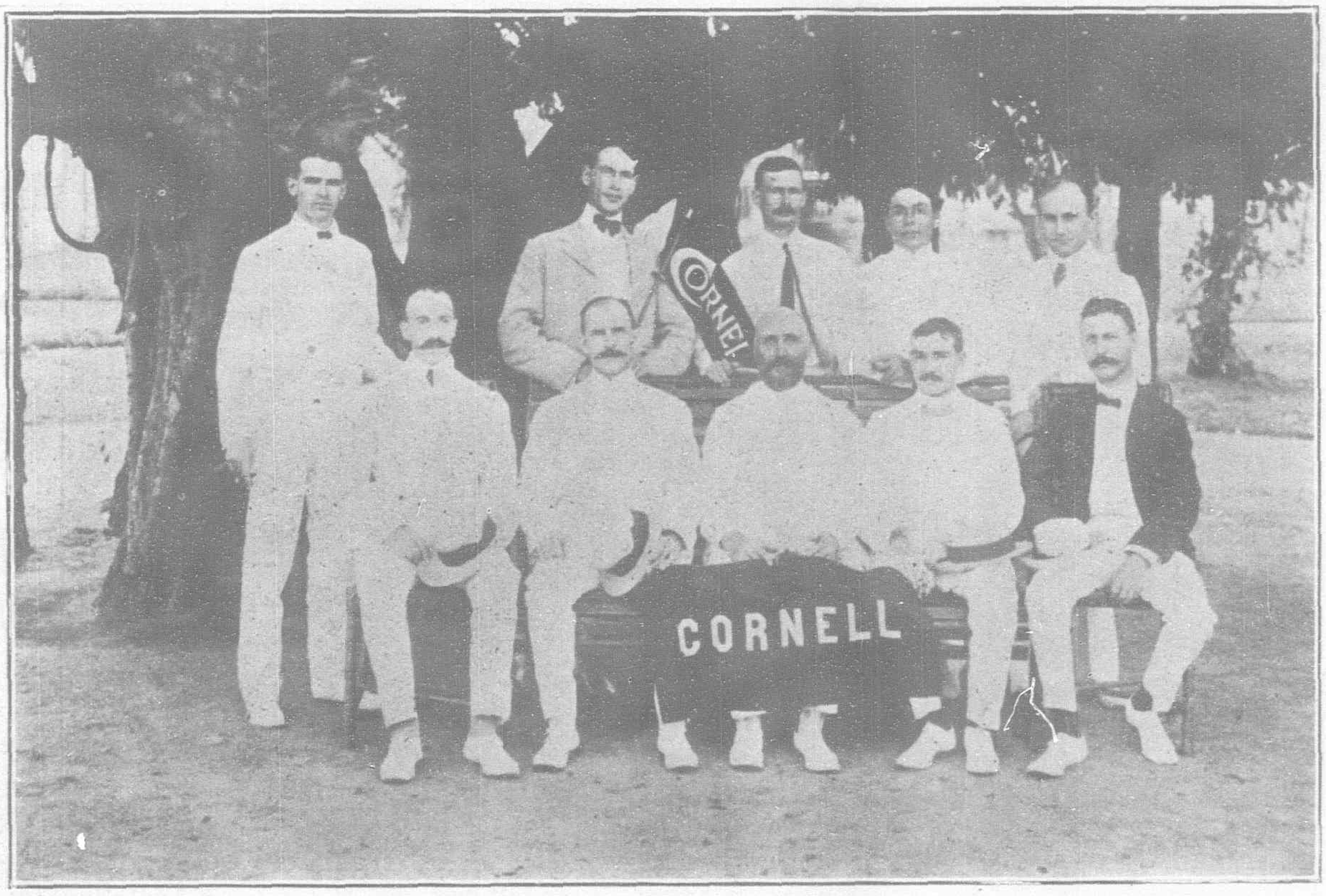
BRITISH DEVELOPMENT OF CHINA

At a recent meeting of the Colonial Section of the Society of Arts, London, Mr. Bryon Brenan, C. M. G., lately H. M. Consul-General at Shanghai, delivered an address on "British Commercial Prospects in the Far East." In the course of his paper Mr. Brenan spoke as follows:

"It is in the construction of railways and in the opening of mines that the profitable employment of capital might be looked for, and I propose to give my idea of what are our prospects in this direction. When the map of China is looked at, the thought at once arises that millions upon millions of British money might be profitably invested in the construction and equipment of railways alone, but as one comes to closer quarters with the question one realizes that the prospect is not so alluring. The building of railways has but recently begun, and, to judge from the start that has been made, it looks as if it was the desire of the Chinese Government that the railways of the country should be a State enterprise. It is a mistake to suppose that the rulers of China are persuaded that they must have railways, and that as China cannot finance them they must have recourse to the foreigner, and make the best terms they can with him. Many enlightened Chinese do see the advantage of railways, but it is not with these that the decision rests. Those who have the final say in the matter care little whether railways are built or not. They have but a dim idea what prosperity attends improved means of communication; moreover, a desire for the welfare of their country is only felt in an abstract sort of way as a good theme for an examination essay, but it does not form part with them of what is called practical politics. What they do realize is that foreign railway concessions are liable to involve them in worries and land them in difficulties, and that on the whole it is best to leave well alone. The English capitalist will go the wrong way to work if he begins his negotiations in the spirit of the man who holds the purse-strings and can command his own terms, and who thinks it an unanswerable argument that unless certain conditions are granted it will be impossible to float a loan. This may, indeed, be the case, and may be very convincing to the would-be contractor, but it does not convince the Chinese negotiator, who, be it remembered, is not particularly anxious to be convinced. When one party is trying to secure the financing and construction of a line, and offers terms which are in every way fair and reasonable, it makes his position very difficult if another person, especially of a different nationality, is underbidding him, or, at any rate, offering terms which may on the surface seem to be less onerous; and I need hardly say that when an agreement is being discussed for the construction of a railway, the only specification being that it shall extend from this town to that, it by no means follows that the lowest estimate will turn out to be the cheapest. To a large extent the Chinese have to take your word for it what things cost and how much is expended on construction as the work proceeds; so with the spending of the money and the preparation of the accounts left entirely to him, you can conceive how a man who is well equipped with mental reservations may be willing to undertake the task on very low terms, and to find the money as low even as 4 per cent., and here I must leave you to draw your own inferences. A consideration which will carry weight is this: that the constructor who spends a large part, and even an unprofitable part, of the available money in the purchase of Chinese materials, and, as it were, does not take the money out of the country, will be going a long way towards ingratiating himself with his Chinese employers. In pursuance of this policy, the Belgians, with an eye to future favors, are buying largely from the Government ironworks at Han-Yang. So far the English are only engaged in the construction of one railway—from Shanghai to Nanking. On the successful issue of this undertaking a great deal depends, for the Chinese will soon have the opportunity of judging which of the several foreign companies is serving them best. So far, everything is in our favor. To begin with, the Shanghai-Nanking Railway passes through the richest portion of China, and if railways are to be remunerative in any province, this railway has the best chance. What will tell in the long run is the reputation for good faith and fair dealing, or the reverse, which the different syndicates now engaged in railway construction establish for themselves. In the eagerness to secure immediate profits this fact is apt to be lost sight of. A shabby trick or a bit of sharp practice which may bring in an immediate thousand pounds will cost more than a hundred thousand. I must refrain as much as possible from touching upon politics, but closely connected with our future trade is the tendency of some powers to mark off certain parts of China as their especial sphere of interest or influence. It may be permitted to hope that, as one outcome of the war now proceeding in the Far East, all tampering with the integrity of China will cease, and that some sort of Monroe Doctrine will be proclaimed. The Chinese Government, left to itself, is willing to give to every country, I will not say a fair field and no favor, but at any rate some sort of a field and no favor; but a sphere of interest has a way of developing into a sphere of influence, and then into an exclusive preserve. The manner in which railways are being financed opens the way even now to preferential treatment. It is not much good having an impartial tariff of duties for all sorts of merchandise if the railway directors are able to counteract this by fixing arbitrary rates of freight, and it is not at all impossible that those who have the control of a railway could make it very unpleasant for any British enterprise which depended for its success on punctuality in transportation and on reasonable rates of freight. The fact that the control of railways will be left very much to companies of different nationalities, and in some cases to companies that must do the bidding of their protecting governments, must cause some anxiety, and supplies a strong reason why it is desirable that the whole rail way system of China should pass under one honest, impartial, and competent management, if such can be devised.

"It is in the exploitation of her mineral resources that one might look for a great improvement in China's material condition. We know what the potential wealth is in this direction, and one impatiently longs to bring this wealth to the surface. With coalfields, it is said, sufficient to supply the whole world

ENGINEER ALUMNI OF CORNELL UNIVERSITY, AMERICA, IN THE PHILIPPINE ISLANDS



READING FROM LEFT TO RIGHT—(Seated) Mr. C. H. Kendall '95, Railroad Engineer, Bureau of Engineering; Mr. J. W. Beardsley '91, Consulting Engineer to the United States Philippine Commission and Chief of the Bureau of Engineering; Mr. H. Krusi '82, 1st vice-President, Atlantic, Gulf, and Pacific Company, contractor, Improvement of the Port of Manila; Mr. O. L. Ingalls '86, Engineer-in-Charge of the new Manila Sewer System, office of the City Engineer; Mr. H. C. Delano '95, Assistant Engineer, Improvement of the Port of Manila. (Standing) Mr. A. F. Armstrong '01, Engineer, Manila Sewer System, and Acting Superintendent of Water Supply and Sewers, office City Engineer; Mr. M. E. Conklin, '00, Assistant Engineer with Messrs. J. G. White & Co.; Mr. H. E. Hyde '00, 1st Assistant Engineer, office of City Engineer; Mr. A. Gideon '95, Assistant Engineer-in-Charge of Sewers, office of City Engineer; Mr. A. H. Higley '99, Chief Surveyor, Bureau of Engineering. Mr. A. H. Perkins '93, former Chief Engineer of the Benguet Road, now on leave in the United States, who does not appear in the photograph, completes the list of Cornell engineers in the Philippines engaged in professional work.

for 3,000 years, China is annually importing coal to the extent of 1,400,000 tons at a cost of one million sterling. Left to itself, the Chinese Government is willing to leave all minerals where they are now—safe beneath the surface; but once the persistent foreigner insists on being given an opportunity of extracting them, Chinese subjects will follow in his wake, and claim their share of the newly-discovered riches. Here, as in many other instances, we shall probably fight the fight, and the Chinese will reap the fruits of the victory, but it all makes for what should be our chief aim: the amelioration of the condition of the Chinese people.

"In the new Commercial Treaty, which owes its existence to the Boxer outrage China, undertook within one year to conclude the revision of the existing mining regulations. It is now over two years since the treaty was signed, but the new mining regulations framed in the spirit indicated have not yet appeared. One or two sets of mining regulations, it is true, have been published, but they appear to have been framed with the object of discouraging the employment of foreign capital. Treaties are effective only so long as the foreign merchant has a personal interest in the property, and keeps his eye on it. Particularly in the case of exports is the limitation fixed by treaty a delusion. We know how the commerce between two independent countries can be injured and even killed by excessive and uncertain duties. In China it is not a question of independent countries, but of adjacent provinces, even of neighboring districts, one might almost say, of next-door villages. It is not only the practices of the native tax officers in the interior which call for criticism and are capable of improvement. The remedy here, I fear, must wait until wiser counsels prevail at Peking, or until some events, unforeseen at present, place the foreign powers who wish China well in a position to compel reform. The opportunity of a lifetime came in 1900, when, after the Boxer affair, foreign troops occupied Peking, and the terrified Government was in the mood to make adequate reparation. Here was the opportunity to render the people of China great service by exacting from them what a wise and good Government ought to give to its people voluntarily. The foreign powers, acting in concert, need have asked for nothing which would not in the first instance have been of direct advantage to the country, and our compensation would have come later in the shape of a vastly increased trade. But unfortunately the foreign powers interested seemed unable to act in concert, except for the rather ignoble purpose of extorting money out of the Chinese Government, which, of course, meant money extorted from the Chinese people. Everything else but indemnity seems to have been lost sight of."

PHILIPPINE SECURITIES.

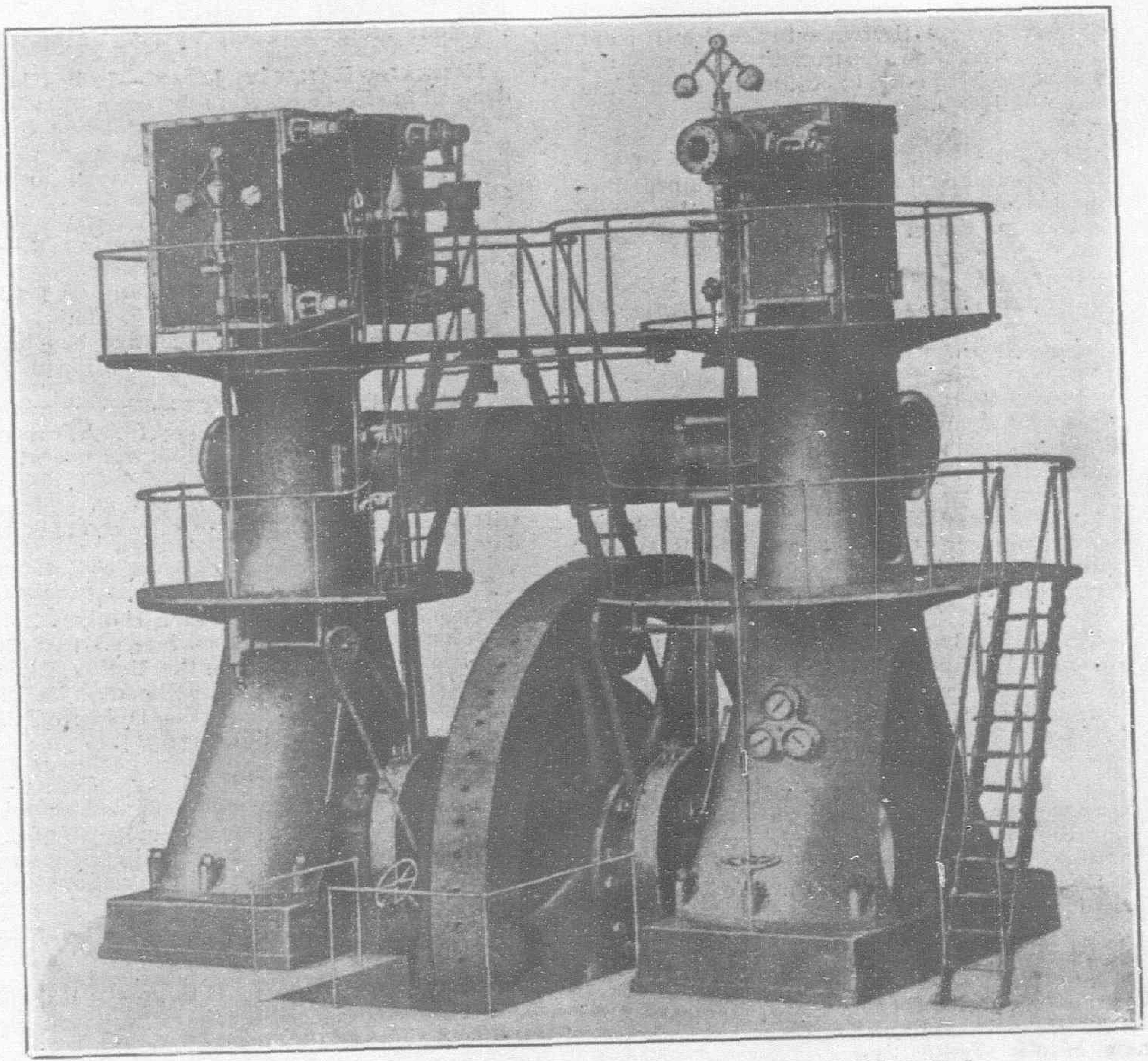
A dispatch says that the recent offering of the $2,500,000 lot of Philippine Improvement Bonds to the financiers of the United States, through the Bureau of Insular Affairs at Washington, brought a large number of bids, indicating thorough confidence on the part of the bankers of the homeland in the securities offered on the market by the Philippine Commission. The bid of the Mercantile Trust Company of St. Louis was the highest received by Colonel Edwards, this concern offering $109 and accrued interest, for every $100 bond, or a premium of 9 per cent and the interest which may have accrued between the date of issue of the bonds, and the date of delivery to the successful bidder. Surprise was expressed at Washington that a western concern should have outbid the keen Wall Street firms. The bonds were to be delivered to the Mercantile Trust Company of St. Louis on March 15th.

CEBU (P. I.) ELECTRIC LIGHT PLANT

The Bryan-Landon Company of Manila, mechanical and electrical engineers and general contractors, will install a modern electric light plant at Cebu, the capital city of the Province of Cebu, Philippine Islands. They hold a half interest in the franchise, Mr. Martin M. Levering, of Cebu, who obtained it, being the other partner in the enterprise.

More than a year ago Mr. Levering applied to the Municipal Board of Cebu for a franchise for a telephone system which met with the approval of the Provincial Board and the Philippine Commission and was granted in November, 1903. Within six months after that time the Bryan-Landon Company had installed a modern telephone system of American manufacture, and from the beginning it has been an unqualified financial success. The system is in perfect working order and has given such universal satisfaction that it prompted Mr. Levering to sound the people of this enterprising provincial city on the question of an electric light plant. They entered heartily into the proposition, offering to give the enterprise all the support in the way of patronage they can command. Mr. Levering immediately made a proposition to the Bryan-Landon Company, and gaining their consent to cooperate with him in the enterprise he immediately carried the matter up to the Municipal Board, which approved of the franchise and sent it up to the Governor-General of the Islands for his sanction. General Wright acted promptly in the matter and on February 24th, of this year, approved the franchise, which was issued in the name of Mr. Levering.

The Bryan-Landon Company announce that they expect to have the plant in operation within six months from the date of the franchise. The Bullock electric dynamo which is directly connected with the latest improved vertical cross-compound engine, the entire plant being manufactured by the Allis-Chalmers Company, Milwaukee, Wis., of which the Bryan-Landon Company are the Manila agents, will be installed. The cross-compound type of engine is especially designed for large central station work, and for plants of the Cebu character. The excellence of the machinery is assurance to the people of Cebu that they will have a most satisfactory electric light system.



TYPE OF ELECTRIC LIGHT PLANT TO BE INSTALLED AT CEBU, P. I.

PROSPECTIVE RAILWAY TRAFFIC.

After making a tour of inspection of the property of the Manila and Dagupan Railroad Company, recently, General Manager Higgins, of the corporation, wrote a letter to Commissioner Cameron W. Forbes, Secretary of Commerce and Police, Philippine Government, reporting in an optimistic vein the result of his observations in the northern provinces of the Island of Luzon. Mr. Higgins' letter follows:

"I have just returned (March 8th) from up the line, the object of this special trip having been general traffic inspection and to make an inquiry into rice, sugar, and general freigh held in the zone of the railroad. I thought it might interest you to know that we have in sight at present moment traffic which will tax our freight stock to its utmost capacity up to the end of July.

"February traffics will give you an idea of what this means:

M & D. R. R., only:

Rice,	tons transported.	. . . . .	6,932
Sugar,	" "	. . . .	2,930
Various,	" "	. . . .	6,396
	Total.	. . . .	16,258

"The average haul may be taken at 91 kilometers, this giving 1,479,478 ton Kms: in 28 days or say 52,838 per day.

"Taking on 50,000 tons Kms: per day from 1st February up to July 31 represents 9,050,000 or a figure which comes very close to that obtained in our best year, viz: 1896, first half, or say 10,642.374. I myself consider we shall in reality pass this latter figure and make a record.

"I think this proves conclusively that the aftermath of war is behind us, not in front, and that the effect of liberal administration is beginning to tell, and also shows the immense vitality of the country which, in spite of all drawbacks complained of, such as rinderpest, etc., can show a commercial revival equal to the most prosperous year under Spanish administration."

FAR EASTERN ENGINEERING AND CONSTRUCTION

PERSONAL

Sir Herbert Thirkell White succeeds Sir Hugh Barnes, as Lieutenant-Governor of Burma.

Mr. H. J. Highfield has been appointed an Assistant Surveyor on the Kuala Gemas-Kuala Semantan Railway Survey, F. M. S.

Mr. L. D. Tandy, General Manager of the Singapore Tramways, has arrived at his post of duty and taken over the management of the lines.

Mr. K. Takahashi, vice-Governor of the Bank of Japan, has again left Tokyo for London, presumably in connection with the loan questions.

Mr. S. Preston, Secretary to the Government of India, Irrigation Department, will visit the Punjab next month in connection with the proposed canals.

Captain Ahern, U. S. Army, Chief of the Philippine Bureau of Forestry, has returned to Manila from the United States where he spent his vacation times.

Messrs. Masuda and Hata, of the Railway Construction and Traffic Bureau of Japan, have left Tokyo for Korea and Manchuria in order to inspect railways there.

Messrs. Worcester and Luzurriaga, of the Philippine Commission, inspected the Insular Government's rice farm in Tarlac Province, Luzon, the fore part of this month.

Mr. Hooper, Assistant Engineer to the Executive Engineer's Office, Batu Gajah, F. M. S., will soon be stationed at Ipoh to look after that division of the Public Works Department.

Mr. A. E. Benzie, the Secretary of Messrs. Howarth, Erskine & Co., Ltd., of Singapore, and Mrs. Benzie have proceeded home on vacation. During Mr. Benzie's absence, Mr. F. Pollock will act as Secretary.

Mr. J. E. Dunlop has arrived in Sandakan for the purpose of exploiting a guano concession in Borneo granted to himself and his brother. There are heavy deposits of bat guano in Gomanton and other bird's-nest caves of the Island.

Messrs. Howarth Erskine, Ltd., of Singapore, have won a case in the Senior Magistrate's Court at Ipoh, S. S. against Tan Chee Yeong, a miner of Papan, to recover a sum of $2,600, balance due upon a running account for engines and fittings. Judgment was given for $2,550 with costs and interest at 8 per cent.

Mr. Ordan Clyde Cullen, a citizen of the United States, has been granted exclusive privileges in the Straits Settlements, in respect of the following inventions: (1) an invention for self-registering electrically sectional targets; (2) an invention for improving firearms; (3) an invention for "improvements in or relating to apparatus for measuring and recording the velocity of projectiles."

Mr. Fryer, the Chief Resident Construction Engineer of Railways, F. M. S., has just returned to Singapore from Malacca where he inspected the railway works in progress there. The fifteenth mile of the line will shortly be opened for traffic, but connection with the main line will not be made until the end of the present year. That section embraces another ten miles. At the present rate of the Malacca railway's progress, says a Straits paper, the Johore line won't be finished for the next six years to come.

RAILWAYS, SUPPLIES, ETC.

Peking-Kalgan Railway.—The Chinese are seriously contemplating the construction of the Peking-Kalgan railway.

Railway Tunnelling, Korea.—The cutting of the Tongchak tunnel on the Seoul-Fusan line has been completed.

Northern Railway, Siam.—The construction of the proposed northern railroad from Bangkok up the Menam Valley promises to divert to Siam whatever trade with Western China has hitherto traveled through Burma.

Canton-Hankow Railway.—It is reported that the Chinese officials at Peking intend to remain obdurate in the matter of cancelling this railway concession, holding that J. Pierpont Morgan's Company is not American.

Hokkaido Railway, Japan.—It has been decided to effect a junction between this railway and that of the Hokkaido Colliery Company. About a mile of track will have to be laid, and work on the extension will begin about April 1st.

First German Locomotive, Japan.—A trial of a German locomotive, recently imported by the Japan Railway Construction and Traffic Bureau, has resulted satisfactorily. This is the first time that a German locomotive has been used on the Government railways of Japan.

Kyushu Railway, Japan.—This company is about to place 1500 additional freight cars on its line in order to facilitate the transportation of coal from various mines in Kyushu, where stocks have reached over 200,000 tons and are still increasing at the rate of 10,000 tons per day.

Peking-Hangkow Railway.—M. Jadot, Engineer-in-Chief of the Peking-Hankow Railway, has notified the Brussels interest that the line is now finished as far as the Yellow River, the total length being 600 kilometers. The last 300 kilometers, including the laying of the rails, were constructed during 1904.

Nanking-Shanghai Railway, China.—The Hongkong and Shanghai Bank has paid to Sheng Kung Pao £250,000 on behalf of the promoters on account of the Nanking-Shanghai Railway. Pau Taotai, the director of the line, applied for and obtained the sanction of Sheng Kung Pao to draw Tls. 100,000 of this for the purchase of the land for the line.

Railway Enterprise, Hunan.—Work will shortly be commenced on a railway starting from Changsha, Province of Hunan, China, and connecting with the Szechuan-Hankow road via Changte and Chenchow, also in the same province. The cost of the undertaking is estimated at Tls. 10,000,000 of which Tls. 6,000,000 are to be raised in Hunan.

Seoul-Fusan Railway, Korea.—Mr. Megata, Japanese Financial Adviser to the Korean Government, says it is almost beyond question that the Seoul-Fusan Railway will have a salutary effect on the development of Korean industries. But the efficiency of that line depends upon the Port of Fusan, so that there arises the necessity of effecting improvements of the harbor.

Luhan Railway, China.—The Luhan railway has completed its permanent way as far as Hwei-Luh. A construction train runs from that town to Chang-te, and from here to Yen-Cheng some considerable distance has to be traversed in carts or on horseback. The line from Yen-Cheng, which is in Honan, has been completed to Hankow, and passengers can now travel between these two places.

Railway Supplies, Straits Settlements.—Tenders have been accepted by the Government of the Straits Settlements for the following works in connection with the Singapore-Kranji railway extension: Messrs Guthrie & Co., for the supply of sleepers; Messrs. Stiven & Co., for the cement; Teck Chiang, for the supply of stone; Mr. S. Arunasalam, for carting; Mr. S. Vincent, for earthwork.

Selangor Railway Guarantee Fund, F. M. S.—The General Manager of Railways, Federated Malay States, announces that it has been decided to wind up the Selangor Government Railway Guarantee Fund, and subscribers whose moneys have not been returned or their representatives are requested to apply to the Chief Accountant and Auditor, F. M. S. R., for them on or before 30th June, 1905, or the amount will be forfeited and distributed among those who were subscribers on August 31st, 1904.

Railway Construction, South Australia.—The South Australian Government has accepted the tender of Smith & Dyke, of Adelaide, for the construction of the line from Tailem Bend to Pinaroo. The work includes the construction of 86½ miles of permanent way and 3½ miles of siding, and the maintenance of the same for six months from the date of completion; but a departure from the original specification excepts the station buildings. The rails, signals, and weighbridges are not included in the price at which the contract was let, which was $321,230.

A bill is before parliament to authorize the construction of a line of railway from Grove Hill Station in the Northern Territory to Iron Blow, a distance of 13 miles. The line offers no engineering difficulties, the steepest gradient being 1 in 40 and the sharpest curve has a radius of six chains. The engineer for the proposed company is Mr. James Chapman Lovely, of Adelaide.

Rangoon-to-Shanghai Railways.—Referring to a suggested railway from Rangoon to Shanghai, an English advocate of the plan says: "The road is now completed to Lashio, in the Northern Shan States. That line does not pay, and it cannot do so until it is constructed at least past the Kunlung Ferry on the Salween to the borders of China. Then it would attract Chinese caravan traffic. The route as far as the Mekong western watershed is comparatively easy for a mountain railway. If the eastern bank of the Mekong can be gained by a reasonable route, the Yangtze can be reached without very great difficulties. When Shanghai has connected itself by rail with Chung-king, on the Yangtze, it will be time to find means of joining the two railroads. The Yangtze has abundance of power for an electric railway; so has the Mekong. This line will be an answer to, and will supplant, the Trans-Siberian Railway." In connection with the above it is interesting to note the several steamers that have recently sailed from Baltimore and New York to Rangoon with cargoes of steel rails.

Hankow and Peking Railway.—The railroad between Hankow and Peking is expected to be finished by April, all but the bridge over the Hoang Ho River, which, on account of the numerous floods, is a big undertaking in itself, being two miles long. Three hundred and eighty kilometers from Hankow north to Yencheng are now open to traffic. From Yencheng construction trains run between 200 and 300 kilometers further to the Yellow River. From Peking south 390 kilometers are now open to traffic as far as Shen Te. Thence construction trains run daily as far as Chang Te, at the 580th kilometer, and as occasion requires 60 kilometers further to a place called Wei Hin. Thence 100 kilometers are under construction as far as the Yellow River. About the middle of this part under construction the Peking syndicate's line from Huai Ching eastward crosses the railway. It will doubtless eventually be connected with the German

Tsinan line or with the Anglo-German line down to Nankin. There is abundance of passenger traffic and freight on the portions open to traffic, and large numbers of passengers go by a certain limited and irregular number of trains on the construction portion. The parts open already pay well on their capital cost. It is expected that express trains will be able to cover the 800 miles between Peking and Hankow in 48 hours.

ELECTRIC LIGHTING, TRACTION, POWER, ETC.

Shanghai Electric Tramways, Ltd.—The Shanghai Electric Tramways, Limited, has been registered, with a capital of £10,000 in £1 shares.

Street Lighting, Singapore.—The municipality has arranged with the Singapore Electric Tramway Company to furnish the power for lighting the streets of the city. Work on the extension has been commenced.

Kobe Pier Company.—The Kobe Pier Company has placed its net profit for the last half-year at -Y-26,083, and declares a dividend of 12 per cent per annum. The sum of -Y-5,302 has been placed to the reserve.

Macao and Cholon Electric Lighting.—A company has been formed at Hanoi by M. Bert, a French civil engineer, for the electric lighting of Macao and Cholon. It is understood that the capital of the concern amounts to $600,000.

Han-Shin Electric Railway, Japan.—The Board of Directors of the Han-Shin (Osaka-Kobe) Electric Railway Company has decided to secure a loan of -Y-700,000 from the Third Bank of Japan, the money being required for the construction of new cars.

Navy Hospital, Canacao, Cavite, P. I.—The Bryan-Landon Company, of Manila, is installing two 10-kilowat dynamos of the Allis-Chalmers Company's "Bullock" pattern in the new U. S. Navy Hospital at Canacao, Province of Cavite, P. I., for lighting purposes.

Electric Railway, Seoul.—This street railway line is turning out as a gold mine for the owners. One day recently 34,654 persons were carried. The highest record before this was 28,746 passengers, on the day of the Empress-Dowager's funeral last winter.

Electric Development, Tientsin.—A company has been formed to supply electric energy within the municipal area of Tientsin, North China. The order for the machinery has been placed with the Siemens-Schuckert Works and General Electric Company of Berlin at £65,000.

Kobe Electric Light Company.—The Kobe Electric Light Company for the half-year just closed has declared a total net profit of -Y-55.710, including -Y-1,635, the amount carried forward. A dividend is declared at the rate of 17 per cent per annum, while -Y-8,000 is placed to the reserve.

Big Electrical Contract.—The home office of Messrs. J. G. White & Co., New York, recently secured a contract from the Government of Ecuador for an electric light and power system for the city of Quito and vicinity. It is understood that the contract calls for $1,000,000 worth of equipment including a trolley-car service in the capital.

Tramway Extension, Siam.—Shareholders of the Siamese Tramway Company, Ltd., have authorized increasing capital stock of company by $600.000 for the following purposes: To extend the Bangkok City scheme, 3¼ miles; to construct an electric tramway on the west side of the river, 6¼ miles long; to construct a steam tramway from the company's terminus at Samsen to Pakret, a distance of 12½ miles.

Electric Lamp Bulbs, Japan.—It is announced that the manufacture of electric lamps for the Japanese market is to be carried on in Tokyo on a large scale with the assistance of American capital and under the protection of American patents re-issued by the Japanese Patent Office. The General Electric Company of the United States has formed a coalition with the Tokyo Electric Company, Ltd., to manufacture in the Tokyo factory Edison lamps exactly the same kind as the American product.

Electrical Machinery for Japan.—Two hundred and fifty tons of electrical machinery, from the Preston works of Messrs. Dick, Kerr & Co., have been shipped out from England in connection with that firm's contract of the Tokyo Denki Tetsudo, and Kabushiki Company's tramways. The installation of this system, which, when completed, will cover over sixty miles of line, and operate about 250 cars, is being carried out by Messrs. Dick, Kerr & Co.

WATERWORKS AND IRRIGATION

Irrigation, Punjab.—Measures are being taken to provide a complete staff for the new irrigation works in the Punjab. The work on the new canals is estimated to take at least nine years.

Water System, Kuantan, Pahang.—Kuantan is to have a proper water supply, a sum of $15,000 being provided in the 1905 estimates for the work. The water supply will be carried in from the Galing River, at the back of the town, and will be distributed by means of stand-pipes.

Water Supply, Honolulu.—It is hoped that plans for a gravity system for the Honolulu water supply will be approved by the Legislature. Plans have been prepared for a reservoir in Nauanu holding 100,000,000 gallons, to be 600 feet above sea level. Another smaller reservoir is to be built at a still greater altitude in Kalihi Valley.

Sandakan Water Supply.—In his report on a water supply for Sandakan, British North Borneo, just made public, Mr. Walker, the Commissioner of Lands, condemns the long-proposed Beatrice Waterfall scheme on the ground that the height of the top of that fall is only 74 feet above sea level, and the lowest gap over which the water would have to be pumped in a pipe about two miles long, is 133 feet above sea level. Moreover, the watershed belongs to private parties and would have to be purchased. He is in favor of increasing the capacity of the present reservoir (120 feet above sea level), which contains 270,000 gallons, by excavation, and believes that an expenditure of $5000 would increase the capacity of the reservoir to 600,000 gallons. This source is not perennial and the proposal is to supplement it by connecting the present main with the Mosque tank, which is Government property, and has a perennial supply of 4600 gallons per day. To supplement this, a measurement of the sweet water flowing from three adjacent springs was made (14,000 gallons) giving a total of available spring water of 18,900 gallons daily, which could be used as an auxiliary supply. The above scheme, it is contended, affords a perennial supply of about 20,000 gallons a day in the driest season, which can be increased by laying pipes to other springs a little further away.

Punjab Irrigation Scheme, India.—Instructions have been issued for work to begin at once upon the great irrigation scheme for the Punjab, which has just been sanctioned by the Secretary of State for the Colonies. The preliminaries to settle the exact alignments of the main channels will take some little time, but this once done, the Punjab Government will be provided with funds to push on as quickly as the labor supply available allows. To enable so vast a matter to be grappled with effectively, it will most probably be necessary to create two new superintending engineer circles, with the usual complement of officers to supervise the operations; but this is a matter which will be considered by the Local Government at Lahore. It is understood that Sir Charles Rivaz hopes to be able to get the whole undertaking completed in about nine years, the expenditure for several seasons to be at the rate of Rs. 115 lakhs annually. No difficulty will be made by the Government of India in regard to the provision of this money, and the progress will be limited only by the possibility of economic engineering. The Upper Jhelum and Upper Chenab Canals will be taken in hand first, the Lower Bari Doab Canal will come last as the work on it is easier, and it depends for its water supply upon the other two. The total cost is estimated at Rs. 3 crores for each of the Upper Jhelum and Chenab schemes, and Rs. 1¾ crores for the Lower Bari Doab scheme. The total area to be annually irrigated by means of these canals is some two million acres, which, it is estimated, will give an annual return of close upon ten per cent on the capital outlay. The project, therefore, will be exceedingly profitable. It will also be very important, as it insures protection from famine to the immense area now liable to this scourge, besides opening up to cultivation a large region, which is at present sterile. The scheme for converting the Wular lake in Kashmir into a reservoir to feed these canals does not form part of the project actually sanctioned. It can be taken in hand, however, at any time hereafter as an addition, its estimated cost being only Rs. 49 lakhs. Its principal use will be to increase the supply of water available for irrigating cold weather crops which are especially important in the Punjab. Mr. Preston, head of the Irrigation Department, will most probably proceed to the Punjab in April, by which time the main alignment should be ready for inspection.

BUILDINGS

Public Buildings, Pahang, F. M. S.—The Government has made provision for many new buildings during the current year. The principal construction items include $4,000 for surveyors' quarters, $8,500-odd for police and goal buildings, $7,200 for clerks' quarters, $20,000-odd for hospital buildings, $4,000 for police inspectors' quarters, $1,200 for new offices at Pekan, $1,000 for repairs to wharf and $1,000 for special repairs to the Pekan Residency.

BRIDGES

Iron Bridge, Benta, Pahang.—Thirty-five thousand dollars are to be spent by the State of Pahang, F. M. S., in erecting an iron bridge at Benta on the Trunk Road, 17 miles from Lipis, in place of the existing wooden structure.

PUBLIC WORKS

Frontier Roads, Western Tibet.—It is announced that the roads on the British frontier leading to Western Tibet will soon be improved.

Road Construction, Madras.—The Government of Madras has sanctioned an estimate amounting to Rs. 73,800, for constructing a road from Kolavalur to Utukur in the Nellore District.

Naval Dockyard, Siam.—The Bangkok Dock Company has obtained from the Siamese Navy Department the contract of deepening and repairing the docks at the Rong Law. The value of the contract is Tcs. 403,000 and it will take a year to finish the work.

Huangpu Dredging Project, China.—The Viceroy of Liang-Kiang has asked the Foreign Office at Peking to entrust the question of dredging the Huangpu to the Shanghai Taotai and the Superintendent of the Customs and that experienced foreign engineers be engaged for the work. It is estimated the undertaking will cost Tls. 460,000.

Hyogo Canal Company, Japan.—The Hyogo Canal Company of Japan has failed to fulfill certain conditions imposed by the authorities—the repair of certain works—and the dues on boats using the canal have consequently been attached by the prefectural authorities up to February next year. The money will be used for the execution of the work which was required to be done.

Harbor Dredging, Shanghai.—Messrs. John Swire & Sons, of London and the Far East, have acquired a dredge of the Fruhling type which is now on its way from London to Shanghai to deal with the vast accumulations of silt opposite the wharves of the firm at Shanghai. She is a twin-screw steamer of 850 tons capacity. Her length is 165 ft., beam 30 ft. 3 in., the loading draft 12 ft. 6 in., while she can attain a speed of 8½ knots. A sister ship of this dredger, the Thames, easily lifted 4000 tons per hour during her trials.

Harbor Improvements, China.—It has been recommended that tenders be invited for the extensive harbor improvements which it is proposed to make at Shanghai. The estimated cost of the work is $12,000,000. Three moles, of a length of 5,500, 5,200 and 4,000 ft., respectively, are to be built. There is to be a depth of 16 ft. at low water alongside the quay. The moles are to be faced with granite and the head of each mole is to consist of an iron caisson filled with concrete. Eight years will be required for the completion of the improvements.

Pahang Road Improvements.—Sixty thousand dollars have been appropriated by the State of Pahang, F. M. S., for the maintenance of the Pahang Trunk Road from Lipis to the Gap, a distance of 62 miles; $40,000 for the upkeep of the branch road from Tras to Bentong, 21 miles; and $8,800 for the maintenance of bridle-paths and minor roads. Twenty thousand dollars has been set aside for an examination of the country between Kuantan on the coast and the present cart road system in the Ulu, and as the first installment towards the cost of a cart road trace. The Bentong-Telemong Road, now under construction, is estimated to cost $778,413 for 50 miles, and the second vote on this account provided for 1905 amounts to $104,000.

Pahang Public Works Department.—To cope with all the important improvements set down in Pahang for 1905, Mr. N. T. Gray, the State Engineer, has been proportionately increasing the staff of the Public Works Department. Up to last year there were only two European officers in the department, viz:—The State Engineer and one Assistant Engineer. This year, however, the senior staff will comprise, exclusive of the State Engineer, three Executive Engineers (one each in Raub, Bentong, and Kuantan), two Assistant Engineers (one each in Lipis and Bentong), and one Clerk of Works (in Pekan). Mr. H. C. Paxon is in executive charge of the coast districts of Kuantan and Pekan, Mr. E. L. Bennett looks after Raub, Mr. W. F. Dugdale is in charge at Bentong, and Mr. A. E. Yzelman is at Pekan.

Shanghai Docks Scheme.—Messrs. Moller Brothers state in their circular that the "well devised scheme of Mr. J. R Twentyman, in disposing of all the Shanghai Docks and their properties" to some unknown European corporation, does not seem to have borne the fruits of success. The time for its completion is now well overdue, and those parties filled with great promises as to the result are now anxiously looking forward to a daily-expected consoling wire. In the meanwhile dockages, repairs, etc., are being attended to as punctually, smartly, and economically as heretofore—all of which is interesting seeing that it relates to facts. But assurances have been received in Shanghai recently to the effect that shareholders will not have long to wait for the consummation of the scheme.—*The Straits Echo.*

SHIPBUILDING, MARINE, ETC.

Shipbuilding, 1904, Japan.—According to *Lloyd's Register* the total number of ships built in Japan in 1904 was 71, with a tonnage of 33,577 tons.

Lighthouses, Midway Island.—President Roosevelt has issued an order directing the Secretary of Commerce and Labor to have the Lighthouse Board prepare estimates for the erection of suitable lights, either lighthouses or lightships, at Midway Island.

Kaiping Wharfage Dues, Chinhwang Island.—The authorities of the Kaiping Mining Office at Chinhwang Island, Pechili Gulf, has levied wharfage dues on cargo at the rate of 40 *sen* per ton. In consequence of this ocean freight rates have been increased.

Sale of Steamers.—The Ban An steamer *An Pho*, of Hongkong (formerly the China and Manila steamer *Esmeralda*), has been sold to Japan for £16,000. She is a vessel of 966 net tons, and was built at Port Glasgow in 1891. The steamer *Argus*, owned by Messrs. Archibald, Curry & Co., of Melbourne, has been sold to Japanese for £16,500. She is a vessel of 1822 tons net, and was built at Newcastle in 1889.

Trial Run of Steamer "Srie Manggor.—The trial run of about forty miles of this vessel, a production of Tanjong Pagar Dock Company, of Singapore, was successful. The vessel was built for the Stoomboot Maatschappij, Blitong, at the Keppel Harbor section, the contract time being eight months. She was, however, completed in 6½ months. The dimensions are: Length over all 100 feet, breadth moulded 17 feet, depth 7½ feet, draft 6 feet, with a contract speed of 8½ knots.

Zamboanga Extends Commerce, Moro Province—The Legislative Council of the Moro Province, Philippine Islands, has empowered the Provincial Governor to conclude arrangements with the China-Manila Navigation Company of Hongkong for their vessels to stop at Zamboanga just as soon as satisfactory freight and passenger rates are guaranteed. In exchange for these boats calling at that port, a freight business of $500 gold, will be guaranteed by the Moro Province. Through bills of lading to and from the United States, Australia, China, and Japan, will be one of the important features of this arrangement. The Governor has also been empowered by the Legislative Council to make final arrangements with the South Philippines Steamship Company of Zamboanga, recently organized, to call once each month at all centers of population along the coast of the Moro Province, for which a guarantee of ₱1500 per month is authorized, providing satisfactory passenger and freight rates can be agreed upon.

China Steam Navigation Company.—Scott's Shipbuilding and Engineering Company, Greenock, England, has contracted to build a further steamer for the China Steam Navigation Company. The business connection between these concerns is probably unique, for it is an extraordinary fact that, of the 62 vessels constituting the company's fleet, no fewer than 54 were built by the Greenock shipbuilding firm. Of this fleet, the oldest is the *Pekin*, of 2,232 tons net, built in 1873 by Messrs. A. and J. Inglis, who also built the *Hankow*, of 2,252 tons, a year later. Two, the *Hoang Ho*, in 1879, and the *Tung-Tung*, in 1900, were built in Shanghai by Messrs. Farnham, Boyd & Co.; two, the *Nanchang* and the *Keweiyang*, in 1890, by the London and Glasgow Company, Ltd.; the *Senking* by Messrs. Napier, Shanks & Bell, Glasgow, in 1895; and the *Min*, of 367 tons, by Messrs. Mordey, Carney, Southampton, in 1900. In the case of the Greenock firm, the orders came generally for more than one vessel at a time; last year there was a contract for six, while two are already on the books for this year, one of them, the *Sungtion*, having only sailed on her maiden voyage a few days ago. It is interesting to note that in 1895 ten vessels were built by Messrs. Scott for this company: in 1901 six, in 1898 six, in 1891 five, in 1890 three, in 1888 two, in 1886 five, and in 1882 four.—*The London and China Express.*

MINES AND MINING

Mining Population, Negri Sembilan.—The mining population in the Negri Sembilan, F. M. S., consists of 179 gold and 22,526 tin miners.

Ruby Mines, Burma.—The Burma Ruby Mines Company, Ltd., has obtained a new lease for 28 years, fixing the royalty at 2 lakhs, with 30 per cent of the net profits.

Nakatsu Gold Mine, Japan.—This mine, which lies in the Chichibu District, Musashi Province and which was discovered in 1903, is expected to yield a monthly output of 3 *kamme* before long.

Raub Mining Returns.—The returns of the Raub Australian Gold Mining Company, Pahang, for the month ended January 28th, show 3621 tons crushed, with a yield of 414.4 ozs. of gold, valued at $16,000.

Gold Discoveries, Japan—It is stated that two more gold fields have recently been found at Ayomura, Ohara, in the Prefecture of Shimane, and at Kawamura, Saga, Prefecture of Saga, the area of the latter mine being very great.

Gold Mining Concession, Korea.—The Italian Minister to Korea has forwarded a communication to the Korean Government, requesting the latter to draw up the necessary contract concerning a gold-mining concession recently granted to an Italian Syndicate.

Coal Export, Japan.—During January, last, 72,364 tons of coal from the Yubari mine in Hokkaido were shipped from Muraran, Japan, to Singapore, San Francisco, and other foreign ports, this being the largest quantity exported in one month since the opening of the mine.

Coal Output, Japan.—The Mitsui Bussan Kaisha was, in 1904, again at the top of the list of Japanese coal exporters, shipping 2,502-354 tons, or nearly half the total export, *viz*: 5,715,153 tons. This was 163,814 tons more than the company shipped in 1903, when the total shipments by all companies were greater, viz: 5,895,392 tons.

Primitive Gold Mining, Japan.—Mr. Sanshiro Kaneko, owner of several gold mines in the Kisen District, Prefecture of Iwate, has discovered that the primitive methods of working gold mines in Japan were similar in some respects to those now in vogue in California. Mr. Kaneko has recently started mining operations on a large scale in the Kisen District.

Sultan of Pahang in Tin Mining.—The Sultan of Pahang intends to start tin mining on an extensive scale, it is announced, both in Pahang and in Selangor, and His Highness's agents have been busy during the last few months visiting likely localities and selecting land. They appear to have found suitable land in Ulu Selangor and in the Temerloh District.

Phailin Mines, F. M. S.—To meet the scarcity of water in the Phailin Mines in hot weather, especially in the Ban Din Nuay and Chong Pahi villages considerable expense has been incurred by the digging of a drain from Mount Baw Hachap, a distance of fifteen miles from the above-mentioned villages. The digging was started three years ago, but owing to the hardness of the rocks and soil and other difficulties, the work has only just been completed.

Gold Mining in Japan.—Mr. Rutherford Harris (formerly connected with the late Mr. Cecil Rhodes), and Captain King have arrived in Japan, as representatives of a Belgian syndicate for the purpose of working the Japanese goldfields, in concert with Mr. T. Wada, ex Director of the Mining Bureau in the Agricultural and Commercial Department, and Mr. Junzo Kawamura. As a preliminary step, these two experts have already entered into negotiations with the Japanese Government for a charter to work the recently discovered Kesen gold mine.

Mining Question, Korea.—With reference to the demands of the various Powers for mining concessions in Korea, the Korean authorities have stated that only one mine can be conceded to each of the Powers accredited to Korea. The Government has therefore refused the British request for a gold mining concession at Russian mine, as the Ensan gold mine is already in the possession of a British syndicate. It is stated that in the event of further demands being made for mining concessions, the Powers interested will be obliged to accept the terms proposed by Korea.

Malay States Gold Ouptput.—The following return for January, 1905, is compiled from figures supplied by the gold mine managers:

Name of Company.	Stone treated	Gold worn.	Value.
Malaysian Co................	1,588	526	21,040
Raub Australian Gold Mining Co.........	3,621	414	6,000
Kechau Gold Fields......	404	84	3,200
Batu Bersawah Co..........	200	118	4,250
Kechau Gold Mining Syndicate.			
Total............	5,813	1,142	44,490

All these ventures are in Pahang, save the Batu Bersawah one.

Mining in China.—Mining enterprise in China, with the exception of coal mining, shows little or no extension, the work being burdened with impossible regulations. The inmense general wealth of the Shansi Province, where there are said to be the richest coal and iron deposits in the world, still awaits railway communication. A narrow-gauge line to the north of the Province is now being constructed by a French company, while in the south of the province the Peking Syndicate has surveyed a practical route of the highest promise, and promises to begin the construction of a railway when the negotiations now proceeding in Peking are completed.

Yield of Gold Mines, Formosa.—The value of gold produced in Formosa during 1904 amounted to -Y-1,800,000 as against -Y-1,000,000, the record for 1901. The principal mines of the Island, now under operation, are Shozuiho, Kinsoseki, and Botanko, the annual production of each mine being valued at about -Y-600,000. At Taito, Giran, Keelung, and some other places, there are several mines now under trial boring, and in addition application for working fifteen other gold fields have recently been received by the authorities. The mountainous districts running through the center of the islands are believed to be rich in gold deposits, but in this connection investigation has not yet been attempted.

A New Puddling Machine.—All miners, says *The Times of Malaya*, especially those who have to win the ore from clayey karang, recognize fully the usefulness of puddling machines. These machines have not been introduced into the country very long, yet they are universally used throughout the Native States. The Chinese have gone in for them to a very large extent. What would Tronoh or Tambun be without puddling machines? February 1st saw the introduction of a new puddling machine which bids fair to outrival its predecessors. Application has been made to the Government by Messrs. Addis and Martin for patent rights for this. From what has been seen of this machine it is likely to revolutionize mining in the Federated Malay States. Truck loads karang of were dumped into it and were no sooner in than out again ready for the landshute.

Malay States Tin Mining.—During 1904 the outpnt of tin from the F. M. States was 856,238 piculs, being an increase of 25,590 piculs on the previous year. The increase from Selangor was 16,747 piculs, Perak 7,264 piculs, and Pahang 2,194 piculs. Compared with 1903 the output from Negri Sembilan showed a falling off to the extent of 615 piculs. The following are the figures:—

	1904	1903
Perak	443,506	436,242 pcls.
Selangor ...	300,412	283,664 "
Negri Sembilan	84,849	85,465 "
Pahang ...	27.469	25,275 "
Total	856,238pcls.	830,648 pcls.

The duty collected on the tin exported as above shows a decrease of $779,698 compared with 1903. The figures are as follows:—

	1904	1903
Perak	$4,607,558	$5,067,284
Selangor ...	3,138,649	3,364,300
Negri Sembilan ...	888,393	987,063
Pahang	178,808	174,461
Total	$8,813,410	$9,593,109

Kolar Gold Field India.—The following are the returns for the month of January 1905:—

Balaghat.—4,000 tons of quartz crushed yielded 3,113.43 oz. and 2,750 tons of tailings cyanided yielded 259.03 oz., making a total of 3,372-46 oz., as compared with 3,515 oz. in December 1904.

Champion Reef.—Milled 16,200 tons which produced 15,617 oz. of Gold, 14.013 tons of tailings treated by the Cyanide Process produced 2,122 oz. of Gold, making a total production of 17,739 oz. of Gold, as compared with 17,500 oz. in December 1904.

Coromandel.—682 tons of quartz crushed yielded 223.30 oz. of Gold and collected from Plates 370.22 oz., making a total production of 593.52 oz. of Gold as compared with 5[illegible]8 oz. in December 1904.

Mysore West.—Mill ran 693 hours crushed 2,297 tons and yielded 1,068 oz. of bar Gold.

Nundydroog.—6,500 tons of quartz yielded 5,439 oz. of Gold and 5,018 tons of tailings cyanided yielded 517 oz., making a total of 5,956 oz. of Gold as compared with 5,954 oz. in December 1904.

Ooregum.—Stuff crushed 10,159 tons produced 4,661 oz. of Gold and 10,341 tons of slimes and tailings cyanided produced 996 oz., making a total production of 5,657 oz. as compared with 5,766 oz. in December 1904.

Mysore.—16,050 tons of quartz crushed produced 15,330 oz. and 12,950 tons of tailings cyanided yielded 1,284 oz. of Gold, making a total of 16,614 oz., as compared with 17,256 oz. in December 1904.

Hutti (Nizam's).—1,158 oz. of Gold from 2,000 tons of quartz crushed.

Oil, Island of Sakhalin, Asiatic Russia.—Before the Russo-Japanese war Russian geologists and engineers, exploring the Island of Sakhalin, discovered there vast oil deposits. The oil on the island is quite near to the surface, 1 to 275 ft. depth, in form of subearthen lakes, with areas up to 8,000 sq. ft. The oil forms natural gushers, and, according to the statement of C. S. Patonoff, the oil deposits of Sakhalin are richer than the oil deposits of America. The oil deposits are situated 10 to 25 miles from the eastern coast of Sakhalin, on which coast many bays are located, permitting steamers with 20 ft. draft to touch them. The bays are frozen only four months, and even then the ice can be broken by special steamers, called in Russian "Ledokol." The war has not decreased the interest of the Russian enterprise in this discovery, but has increased it, as the Japanese and English coal merchants refused to cover the coal demand of the Russian navy. Therefore it is decided to use as fuel for the Russian navy liquid fuel, produced from Russian territory; to the newly organized Russian Sakhalin Oil Company at Charkoff, Russia, the government granted a monopoly and other privileges. The new company is said to be the only concern able to compete in all countries of eastern Asia with the Standard Oil Company, and other oil concerns. The development facilities of the oil deposits are quite exceptional; the labor of Russian, Chinese, and Corean laborers is extremely cheap, etc. During the first period of its business the Russian Sakhalin Oil Company proposes to produce 600,000 to 700,000 tons yearly. This oil will be refined and placed on the marketsas follows: 60% as kerosene, 30% as liquid fuel, and 10% as lubricating oil and other products. This business will require a capital of Rbls. 3,000,000. Bakou concerns with an equal capital produce over 800,000 tons of oil yearly. With the increase of the business the capital of the Russian Sakhalin Oil Company will be correspondingly increased, according to the by-laws of the company.

IMPROVEMENTS IN PHILIPPINES

New Telephone Company, Manila.—The new telephone company, which is being organized in the United States for the control of the Manila field, will have a capital stock of $300,000.

Highway for Samar.—The Civil Commission has appropriated -P-32,000 for the construction of a road from one side of the Island of Samar to the other, a distance of 35 miles. It will cost, according to the figures of Mr. J. W. Beardsley, Consulting Engineer to the commission, -P-140,000 to complete the road.

Railroad Building.—Mr. John M. Egan, President of the Central of Georgia Railroad Company, and Mr. John Pugh Green, First vice-President of the Pennsylvania Railroad Company, have sailed from the United States for Manila in the interest of a syndicate of which they are the head, to look over the railway construction scheme presented by the Government. It is said this syndicate will undertake to build the lines planned for the Island of Luzon.

Illuminating Cocoanut Oil.—In the Government Laboratory interesting tests have established the fact that cocoanut oil as a source of gas for illuminating purposes is valuable. The cost of producing gas from this oil does not exceed, it is claimed, that of gas produced from coal in regions where coal is cheap and accessible, and in the Philippines, where coal is a luxury to the individual consumer, almost, the manufacture of illuminating gas from the oil of the cocoanut may yet prove a great boon to the inhabitants.

Road Building, Moro Province.—Work on the roads throughout the Moro Province is reported to be progressing favorably, it being the intention of the Legislative Council to place the present permanent highways in thorough condition before beginning to build new roads. Three thousand pesos have been appropriated for the completion of the Mercedes Road to the Tamaga River, Mindanao; also a like sum for the completion of the Talontalon Road in the same island. When these roads are opened up Zamboanga will be in easy communication with the most productive agricultural region of that district of Mindanao.

Iligan-Lake Lanao Road, Mindanao.—Convicts will be employed on the Iligan-Lake Lanao Road, 250 of whom have been sent south from Bilibid, the Government Prison in Manila, for this work. The engineers in charge of the improvement made every effort to employ labor before resort was taken to convicts. Lieutenant Jewett, U. S. A., went twice to Iloilo and returned with a gang of laborers each time, but the laborers struck for higher wages within a few days after their arrival, and were discharged. No other labor being obtainable, the Provincial Governor was compelled to appeal to the central Government for convicts.

Machinery for Manila.—F. L. Strong, representative at Manila of several American machinery manufacturers, is now filling several orders for machinery to be used in the equipment of the Coast Guard machine shops on Engineer Island. The outfit includes a 42-inch planer, a 16-inch slotting machine, a horizontal boring machine, and a Flanders electrically-driven boring mill for cylinders. The machinery for the power plant has been ordered from the Allis-Chalmers Company, and will include two 125 horse-power tubular boilers, measuring 72 by 6 each, with pumps, stacks, fittings, etc. The engine will be an 18 by 30 Standard Reynolds-Corliss, guaranteed to furnish 370 horse-power at a quarter cut-off and working pressure of 150 pounds. A large Gates stone crusher was also ordered for road construction at Binangonan.

Survey of the Philippines.—President Roosevelt has urged, in a special message to the Congress at Washington, a complete and sweeping survey of the Philippine Islands. This survey, it is understood, would cover the fields in which the various insular bureaus are now concerned, and is regarded by the President as a practical and opportune need of the archipelago. It would include ethnologic, geologic, geodetic and mineralogic surveys, and the expense for the work is designed to be borne by the American Government. Much ignorance still prevails concerning the physical construction of the Philippines, the distribution of minerals, forestry, etc. While the various insular bureaus are known to have all that has been possible with the limited means at their disposal, the work has only just begun, and congressional help in this particular would assist in a marked degree in bringing the resources of the Islands to the notice of the people in other countries.

Paranaque Bridge, Philippines.—The Atlantic, Gulf and Pacific Company has undertaken to build a model provincial bridge over the creek at Paranaque, Province of Cavite, P. I., within forty-five days, so that April 15th should see it completed. The sum appropriated for construction is -P-13,000, and while the structure itself will be only 250 feet long and be only an ordinary but substantial public work, the up-to-date methods employed in the placing of the piers is interesting. First of all wooden piles were driven down, after which iron pipes 2 feet in diameter were dropped over them and the space between filled in with cement. In this way a most substantial sub-structure is secured. It should last for an almost indefinite period of time as the cement filling assures that none of the insects which are so fatal to such constructions in the tropics will get in their destructive work. All iron work on the bridge will have a coat of coal tar after erection, when practicable. During the days of military occupation the Army had a bridge over Paranaque Creek, but insects honeycombed the piers and soon rendered them useless. The new bridge will supplant bamboo-raft ferries by which slow process land transportation is now crossing the creek.

Ayala Bridge Contract, Manila.—Details of the bids for the construction of the new Ayala Bridge over the Pasig River have just come to hand, although it was announced in the December number of The Far Eastern Review that the Atlantic, Gulf & Pacific Company had secured the contract. Proposals were received for (a) furnishing material and erecting bridge complete and ready for traffic; (b) furnishing materials on the wharf at Manila: Clinton Bridge & Iron Works, (a) $149,000, (b) $92,000; Milliken Bros., (a) $110,900, (b) $65,800; Penn Bridge Co., (b) $57,480; King Bridge Co., (b) $66,100, alternate plan, (b) $47,600; Atlantic, Gulf & Pacific Co., (a) $64,863; J. G. White & Co., (a) $85,000, (b) $45,000; H. W. Peabody & Co., (b) $45,650; Fred Wilson & Co. (English design), (b) $105,000; Castle Bros., Wolf & Sons, (b) $42,075, alternate designs, (b) $57.940, $69,115, $80,730; Finlay & Co., (b) $45,250; Holliday, Wise & Co., (a) $94,500, (b) $50,500, alternate designs, (a) $105,500, $185,500, (b) $61,500, $120,500; Germann & Co., (b) $54,600, alternate designs, (b) $38,200, $63,200; Froelich & Kuttner, (b) $45,900, alternate designs, (b) $46,100, $46,550. Designs and proposals were received from England, France, Germany, and Belgium, besides those from the United States. The material is to be furnished by the Company. through the U. S. Steel Products Export Company.

MISCELLANEOUS NOTES

Japanese Forestry Exports.—The Japanese Government is arranging to export timber from the State forests to North China and Korea.

Rice Mills, Burma.—Twelve new rice mills, of which eight were in the Rangoon and Hanthawaddy districts, were erected in Burma during 1904.

Cement Industry, Japan.—According to *The Japan Times* the war has dealt a severe blow to the cement industry of Japan, the Russian demand, which was great before the outbreak of hostilities, ceasing to exist.

Factory Equipment, India.—Contracts amounting to $500,000 for extension of Titaghur Jute Company's mill at Calcutta are as follows: Factory and finishing machinery and shafting, Messrs. Robertson & Orchar, Dundee, Scotland; seven Lancashire boilers and set of engines, Messrs. James Carmichael & Co., Ltd., Dundee, Scotland; preparing and spinning machinery, Messrs. Fairbairn, Leeds, England.

Indian Enterprise, Burma.—An Indian trader started a soap factory in the Kemendine Quarter of Rangoon last year. It has succeeded so well that he has purchased 40 acres of land three miles further down town on the railway line, where he proposes putting up an enlarged factory of the same kind.

Menado-Guam Cable.—The steamer *Stephan* has been despatched from Nordenham with the cable from Menado (North Celebes) to Guam on board. This cable will establish communication between Netherlands-India *via* America and Holland. It is expected that the new telegraphic communication will be opened on July 1st next.

French Engineers, Korea.—The Korean Imperial Household Treasury has asked the Korean Foreign Office to open negotiations with the French Minister at Seoul, with a view to the cancellation of the contract for the engagement of four French engineers employed in the briquette factory at Phyöngyang Colliery, which enterprise has resulted in failure.

Cotton Cultivation, Korea.—Samples of American and Japanese varieties of cotton, experimentally cultivated in the neighborhood of Mokpho, Korea, have been received by the Department of Agriculture and Commerce of Japan. The quality of the cotton is tolerably good so the department will probably investigate as to the extent of land available for cotton cultivation in Korea.

Standard Oil in Japan.—Mr. E. S. Sullivan, who for the last seven years has been manager of the Standard Oil Company at Los Angeles, Cal., has arrived in Japan, where he is to be employed on some important developments planned by the Company. The Standard Oil company has been established for a number of years in Japan, and is engaged both in importing American oil and in producing and refining the Japanese product. The company's refinery is located on the west coast, and does most of the business of the country. The present production of the Japanese fields is small, as they are only in course of development, but the Standard is constantly extending its industry there.

FINANCIAL NEWS

Japanese Banking, Korea.—Three Osaka banks are about to establish branch offices in Korea.

Government Loan, Siam.—It is reported that a Siamese loan of £2,000,000 will shortly be issued in London.

Hokkaido Colliery and Railway Company.—The net profits of this Japanese corporation during 1904 were -Y- 921,271,765.

Nippon Railway Company.—The half yearly meeting of this company showed that the total net profits for the period were -Y- 3,800,610

Japan Life Insurance Company.—At the recent general meeting of the shareholders of this company a dividend of 12 per cent per annum was declared.

Japanese Bank, Port Arthur.—The Yokohama Specie Bank has been allowed to open an office at Port Arthur. Mr. Onuki, Sub-Manager of the Newchwang Branch, has been appointed director of the Port Arthur office.

Federated Sawmills, Ltd.—At a general meeting of shareholders of this company, held recently at Ipoh, F. M. S., it was decided to go into liquidation. The company has been working for nine months and during that time has lost about $20,000.

Company Dividends, Tientsin.—The Taku Tug and Lighter Company, Ltd., announces a dividend of 3½ per cent for the latter half of 1904, making 6½ per cent. for the year. The Tientsin Land Investment Company, Ltd., declares a dividend of 4 per cent for the latter half of the year, making a total of 7 per cent for the year.

Dividends Declared, Shanghai.—Messrs. Benjamin, Kelly & Potts, of Hongkong, announce that the following dividends have been declared in Shanghai: Shanghai Gas Company, Ltd., final dividend of Tls. 5, making Tls. 8½ for the year; Shanghai-Sumatra Tobacco Company, Ltd., final dividend of Tls. 6, making Tls. 9 for the year; Maatschappis, etc., in Langkat, Ltd., first interim dividend of Tls. 7½ account 1905

Grand Hotel, Yokohama.—The half-yearly meeting of the shareholders of the Grand Hotel, Yokohama, was held recently. The net profit for the half-year ended December was Y12,563.33, to which was added the sum of Y12,298.61 from the suspense account, making Y24,861.94. From this sum a dividend of Y6 per share for the half-year will be paid, absorbing Y15,000, and it is proposed to write off Y9,861. 94 for depreciation.

Tokyo Gas Company.—A general meeting of the Tokyo Gas Company approved a proposal to present Y1,500 to Mr. Saionji, the auditor, who has just retired after serving the company for sixteen years. The company declared a total net profit of Y414,938, including Y30,839, the amount brought over from last account, and a dividend will be paid at the rate of 14 per cent after placing Y45,428 to the reserve.

Tobacco Company of British North Borneo, Limited.—At the sixteenth ordinary general meeting of the Tobacco Company of British North Borneo (Ltd.), held recently, Mr. W. M. Reaves, manager, presiding, the report and accounts to December 31st, 1904, were unanimously adopted on the proposition of the Chairman, seconded by Mr. Northey. At an extraordinary general meeting held subsequently the resolutions, renewing the power to Mr. Reeves, the manager, to carry on the business of the Company, were passed.

Japan Brewery Company, Ltd.—At the seventh ordinary general meeting of this corporation in Yokohama, recently, the Board of Directors reported that during 1904 the net profits were -Y- 60,111.14, which, with -Y- 4,670.73 brought forward from 1903, made the amount at credit of profit and loss account -Y- 64,781.87. The prosperity of the company has been materially affected through the war with Russia, taxes have been increased and competition is keener, and in view of these factors no dividend was declared. The reserve fund of the company now amounts to -Y- 170,000.

Geo. Fenwick & Co., Ltd.—The net profits of this Hongkong concern for 1904 amounted to $21,709.72, according to the report of the directory, to which is added $10,517.92 brought forward from 1903's account. It is proposed to pay a dividend of 15 per cent., or $22,500 to shareholders; while $8577.67 is carried forward to this year's account. To December 31st, 1904, $124,426.05 were expended in the purchase and reclamation of the new site at North Point. It is expected that the reclamation will, according to contract, be completed by August next.

Japanese Breweries.—Negotiations on the proposed incorporation of the Ebisu, Asahi, and Sapporo Brewery Companies of Japan seem to have met with a hitch, there being a disagreement regarding the assessment of the value of each company. The Asahi Company has concentrated its attention on the extension of its market for some years past, while the Ebisu Company has been increasing its revenue every half year, the reserve being now a very large one. It is expected that, now the accounts for the second half of 1904 of these companies are settled, negotiations will be resumed.

Hongkong, Canton and Macao Steamboat Company, Limited.—The report of the Board of Directors to the ordinary half-yearly meeting of shareholders held in Hongkong recently shows that after paying running expenses, salaries, premia of insurance, repairs and all other out-goings, there remained including $16,362 85 brought forward from last account, the sum of $106,160.88 at credit of profit and loss account. From this amount the directors recommended that a dividend of $1 per share or $80,000 be paid to shareholders, leaving a balance of $26,160.88 to new account.

Straits Development Company, Ltd.—At an extraordinary general meeting of this company, recently held, a resolution authorizing the board of directors to reduce the capital from £305,000, in shares of £1 each, to £76,250, in shares of 5s. per share, was brought up. Mr. A. Gaussen, who presided, moved the necessary resolution, and said the directors were unanimous on the matter. When put, the resolution was declared lost and the chairman demanded a poll. Some discussion then took place as to whether the resolution had been negatived, and the chairman again put the motion to the meeting, and declared it carried. He added that the directors had proxies representing £100,000.

Shanghai Land Investment Company, Limited.—Directors' report presented at the sixteenth annual meeting of shareholders, held in Shanghai, in February:

The working account for 1904 shows a credit balance of Tls. 367,875.25 compared with Tls. 362.189.28 for the previous year. The amount at credit of profit and loss account, after deducting the interim dividend of 6 per cent is Tls. 331,734.95, which the directors recommended for appropriation as follows: To pay a final dividend of 6 per cent on the capital—making 12 per cent for the year, Tls. 156,000; to pay a bonus of Tls. 2 per cent share, Tls. 104,000; to transfer to reserve fund—being interest on undeveloped estates—Tls. 28,813.05; to transfer to reserve fund for equalization of dividends—making it up to Tls. 170,000—Tls., 2,855.24; to carry forward to new account Tls. 40,066.66.

Shanghai Pulp and Paper Company, Limited.—Report of the directors at the annual meeting of shareholders held in Shanghai on Monday, February 27th: The profit and loss account, including the balance Tls. 2,288.56, brought forward from last year shows a credit balance of Tls. 93,560.03. During July an interim dividend of 6 per cent was declared, which has been paid. New additions and repairs during the year 1904 amounting to Tls. 6,091.84 have been written off as well as Tls. 2,500.00 for depreciation; besides setting aside Tls. 15,000.00 for reserve. From the balance, Tls. 42,968.19, to the credit of profit and loss, the directors propose to pay a final dividend of 8 per cent, carrying forward Tls. 6,968.19 to new account. The mill has worked most satisfactorily for the year, showing an increase of profit of Tls. 31,562.37 over the previous year.

Hongkong and Whampoa Dock Company, Ltd.—In the report of the company at the ordinary yearly meeting of shareholders, held recently in Hongkong, the Board of Directors made a statement of accounts for the half-year ended December 31st, 1904, which showed that the net profits for the period, after paying interests due and all charges, amounted to $370,159.03, to which was added the balance brought forward from last account amounting to $505,471.73, making a total of $875,630 76. From this was deducted $10,000 for directors' fees, $750 for auditors' fees, leaving available for appropriation $864,880.76. The directors recommended that a dividend for the half-year of 12 per cent, or $300,000, and a bonus of 2 per cent, or $50,000, in all $350,000, be paid to the stockholders; that $16,591.66 be written from the value of the Kowloon Docks, and the balance $498,289.10 be carried to the new account.

Batu Caves Company, Limited.—This Company has been floated in the Federated Malay States with a capital of £30,000 in 30,000 shares of £1 each. The present issue is 18,000 shares, of which 11,000 are available for allotment. The Company has been formed to purchase the Batu Caves Estate and to acquire such other estate property in the vicinity or elsewhere as occasion offers. The primary article of production is to be Para rubber, but coffee will be grown as a temporary crop until the rubber has overshadowed it. The area of the Batu Caves Estate is as follows: Coffee and rubber, the latter one to two years old, 264 acres; now being planted in rubber, 100 acres; virgin forest and grass lands, 1,493 acres; total, 1,857 acres. The following gentlemen have been appointed the first directors of the Company:Messrs. Thomas North Christie, J. McEwan, H. K. Rutherford, and R. Williamson. Mr. C. Meikle is appointed manager, and Messrs. Barlow & Co., the Company's agents at Singapore.

Green Island Cement Company, Ltd., Hongkong.—The gross profits of this company for 1904 were $444,094.42, as against $319,516 for 1903, and the net profit was $345,054.82, out of which the company pays a dividend of 20 per cent., absorbing $200,000. Fifty thousand dollars have been put to the reserve fund and $95,054.82 carried forward to this year's account. Throughout 1904 the company's factories at Macao, Hok Un, and Deep Water Bay were kept working at full pressure, and it became at last impossible to respond to all orders and inquiries for cement. At Macao the company spent over $80,000 last year in additions and improvements to the factory. The grinding plant at Hok Un is being enlarged. Besides this the company has put up a limestone landing plant which has saved it large demurrage dues and made it more independent of coolie labor. All this accounts for the expenditure of over $120,000 on Hok Un last year. The company has placed orders for two rotary kiln plants to turn out about 16,000 barrels of cement a month, which, it is estimated, will provide for all the company's wants for some time to come. Sales of bricks, tiles, and pipes, etc., from Deep Water Bay has also increased considerably.

General Revenue Philippine Islands.—The Civil Commision has directed the Auditor for the Philippine Islands to transfer on the books of his office from the appropriations for public works and permanent improvements heretofore made, to the general revenue account as unappropriated moneys, the following balances undrawn and to the credit of the various bureaus and offices of the Insular Government on account of said appropriations: -P-60,000 from the appropriation for "quarantine station at Cebu," for the Quarantine Service; -P-696,000 for improvement of the Port of Cebu and -P-251,000 for improvement of harbor at Iloilo, for the Bureau of Engineering -P-135,000 from appropriation for construction of light stations at Capitancillo Islands, Bajo Apo Islet, and Bagacay Point, and for construction and completion of other minor stations, etc.; general improvement of Engineer Island; construction and equipment marine railwall on Engineer Island; and for the construction and equipment of a new light station at Maniguin Island, for the bureau of Coast-Guard and Transportation; -P-179,000 from the several appropriations heretofore made for public works and permanent improvements for the Bureau of Agriculture. In all, the sum of -P- 312,000.

Hongkong-Shanghai Banking Corporation.—The following is the report of the Court of Directors to the ordinary half-yearly general meeting of shareholders held at the City Hall, Hongkong, on Saturday, the 18th February, 1905, at noon:

To the proprietors of the
Hongkong and Shanghai Banking Corporation.

Gentlemen.—The directors have now to submit to you a general statement of the affairs of the Bank, and balance sheet for the half-year ending 31st December, 1904.

The net profits for that period, including $1,492,554.31, balance brought forward from last account, after paying all charges, deducting interest paid and due, and making provision for bad and doubtful accounts, amount to $4,745,544.05.

The directors recommended the transfer of $1,000,000 from the profit and loss account to credit of silver reserve fund, which fund will then stand at $8,000,000.

They also recommend writing off bank premises account the sum of $200,000.

After making these transfers and deducting remuneration to directors there remains for appropriation $3,530,544.05, out of which the directors recommended the payment of a dividend of one pound and ten shillings sterling per share, which at 4s. 16d. will absorb $533,333.33 and a bonus of one pound sterling per share, which at 4s. 6d. will absorb $355,555.55.

The difference in exchange between 416, the rate at which the dividend and bonus are declared, and 1*s* 11 9s. 16d., the rate of the day, amounts to $1,148,246.42.

The balance of $1,493,408.75 to be carried to new profit and loss account.

Directors.—Mr. H. E. Tomkins has been elected chairman for the year 1905 and Mr. H. A. W. Slade deputy chairman. Mr. A. J. Raymond, Mr. H. E. Tomkins and Mr. N. A. Siebs retire in rotation, but being eligible for re-election, offer themselves accordingly.

Auditors.—The accounts have been audited by Mr. W. Hutton Potts and Mr. A. G. Wood, who offer themselves for re-election.

A. J. Raymond,
Chairman,

Hongkong, 7th February, 1905.

ABSTRACT OF ASSETS AND LIABILITIES
31st December, 1904.

Liabilities.

Paid-up capital,		$10,000,000.00
Sterling reserve fund,		10,000,000.00
Silver reserve fund,		7,000,000.00
Marine insurance account,		250,000.00
Notes in circulation:—		
Authorized issue against securities deposited with the Crown Agents for the Colonies,	$10,000,000.00	
Additional issue authorized by Hongkong Ord. No. 19 of 1900, against coin lodged with the Hongkong Government,	6,422,593.00	
		16,422,593.00
Current Accounts,—		
Silver,	$70,956,898.34	
Gold, £3,632,433 10*s*. 7*d*.=	39,104,287.84	
		110,061,186.18
Fixed Deposits,—		
Silver,	$48,560,443.56	
Gold, £5,132,433 16*s*. 0*d*.=	55,327,919.12	
		103,888,362.68
Bills Payable (including drafts on London Bankers call loans and short sight drawings on London office against bills received and bullion shipments),		12,426,024.02
Profit and loss account,		4,745,544.05
Liability on Bills of Exchange rediscounted £4,191,571. 8*s*. 10*d*. of which £3,111,482 0*s*. 0*d*. have since run off.		
		$274,793,709.93

Assets.

Cash,		$37,472,737.62
Coin lodged with the Hongkong Government against note circulation in excess of $10,000,000		8,500,000.00
Bullion in hand and in transit,		5,731,680.95
Indian government rupee paper,		2,035,153.16
Consols, colonial and other securities,		9,214,976.98
Sterling reserve fund investments, viz.:—		
£570,000 2½ % consols at 85 (of which £250,000 lodged with the Bank of England as a Special London Reserve.)	£484,500	
£255,000 2¾ % national war loan, at 90	229,500	
£325,000 other sterling securities, written down to	286,000	
	£1,000,000	10,000,000.00
Bills discounted, loans and credits,		85,601,394.98
Bills receivable,		115,009,136.44
Bank premises,		1,228,629.80
		$274,793,709.93

GENERAL PROFIT AND LOSS ACCOUNT.

Dr. 31st December, 1904.

To Amounts written off:—		
Remuneration to directors,		$15,000.00
,, Dividend account:—		
£1.10/ per share on 80,000 shares = £120,000 @ 4/6,	$533,333.33	
Bonus of £1 per share on 80,000 shares= £80,000 @ 4/6,	355,555,55	888,888.88
To Dividend adjustment a/c:— Difference in exchange between 4/6, the rate at which the dividend and bonus are declared, and 1/11 9/16, the rate of the day,		1,148,246.42
,, Transfer to silver reserve fund,		1,000,000.00
,, Transfer to bank premises a/c,		200,000.00
,, Balance forward to next half-year,		1,493,408.75
		$ 4,745,544.05
Cr.		
By Balance of undivided profits, 30th June, 1904,	$ 1,492,554.31	
By Amount of net profits for the six months ending 31st Dec., 1904, after making provisions for bad and doubtful debts, deducting all expenses and interest paid and due,	3,252,989 74	$ 4,745,544.05

STERLING RESERVE FUND.

To balance,	$10,000,000.00
By Balance 30th June, 1904, (invested in sterling securities),	$10,000,000.00

SILVER RESERVE FUND.

To balance,	$ 8,000,000,00
By Balance 30th June, 1904,	$ 7,000,000.00
,, Transfer from profit and loss account,	1,000,000.00
	$ 8,000,000.00

A. J. RAYMOND,
A. HAUPT, } Directors
W. J. GRESSON,

J. R. M. SMITH, Chief Manager.
C. W. MAY, Chief Accountant.

We have compared the above statement with the books, vouchers and securities of the Head Office, and with the returns from the various branches and agencies, and have found the same to be correct.

W. HUTTON POTTS, } Auditors.
A. G. WOOD,

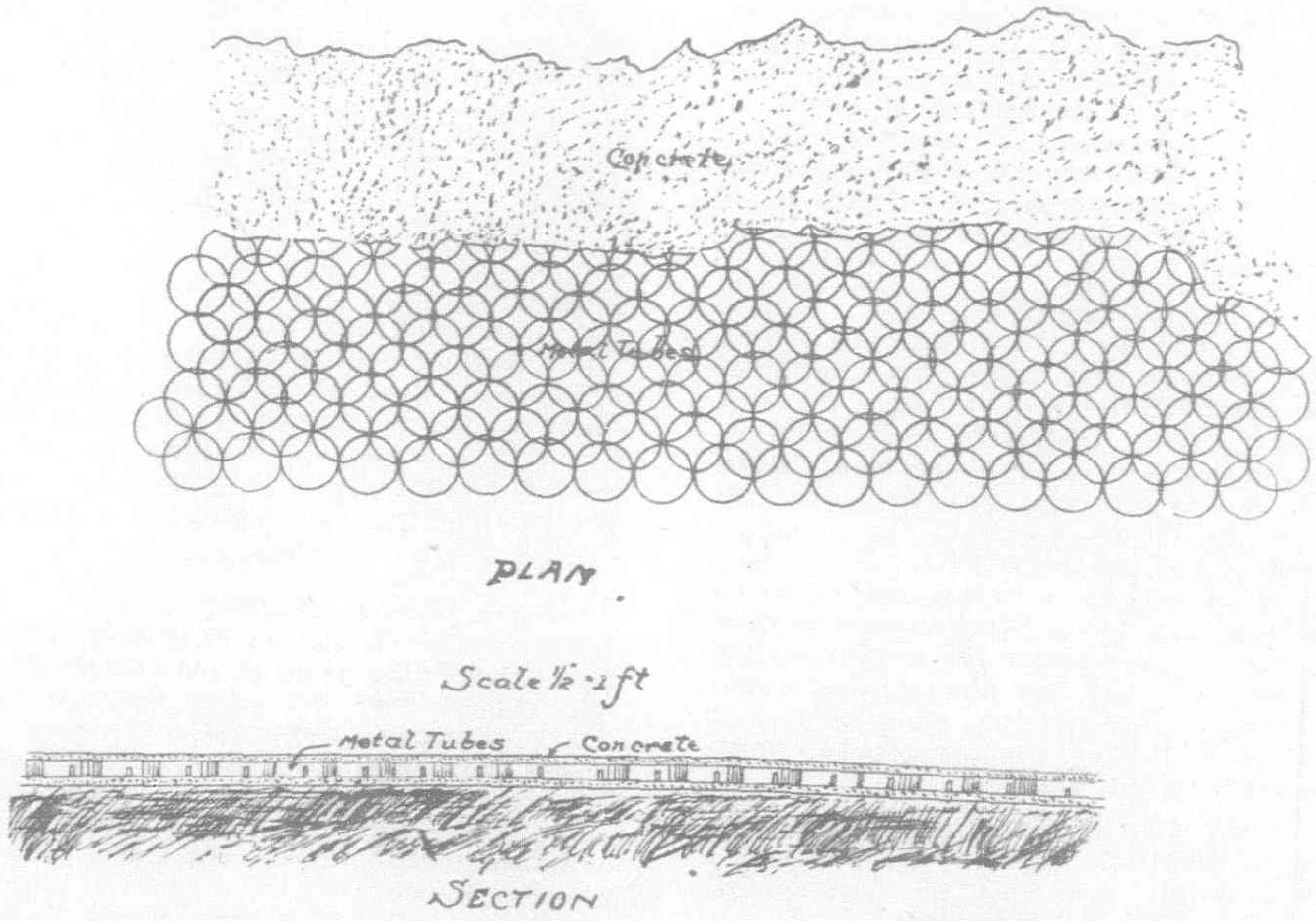
VAN WIE CONSTRUCTION SYSTEM

For some time efforts have been made to secure an interlocking construction material which shall be adapted to architectural needs. From time to time there have been recorded special interlocking devices for building bricks, paving blocks and roofing tiles. The latest device for building construction is now being placed on the market by Elmer E. Van Wie, of Kenosha, Wis., an entirely novel system, and which, in the opinion of many architects and engineers, promises important revolutions in architectural accomplishments. So far the manufacture of the Van Wie structural block from clay has been confined to excellent sample burnings in experimental kilns. Mr. Van Wie has, however, amply tested the merits of his system by placing his blocks in several of the large stores of the United States, made from birchwood, on machines especially constructed by him for this purpose.

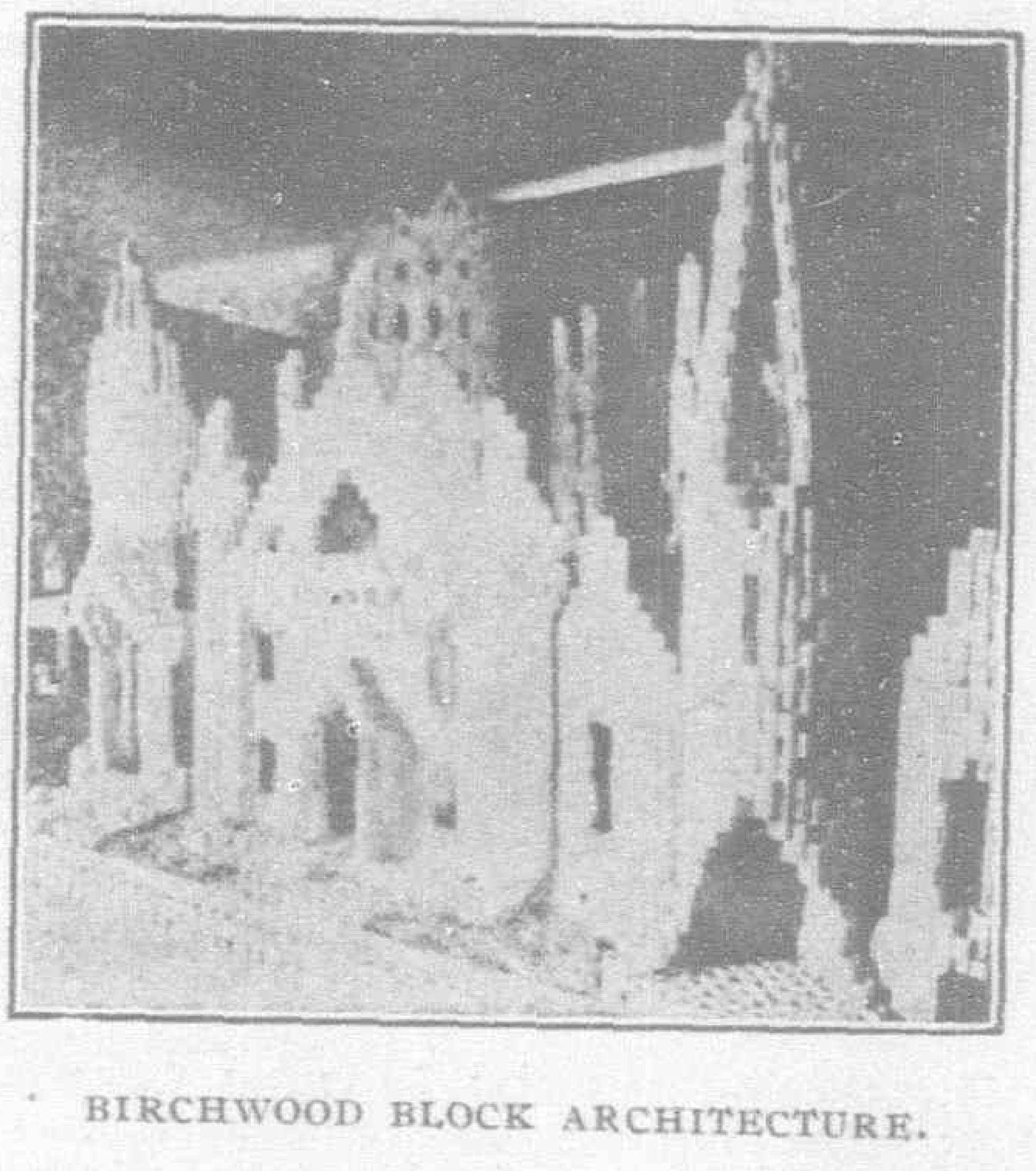
The possibilities of this work are pleasingly shown in the accompanying illustrations of structures made from these birchwood blocks. According to the inventor, their reproduction in clay form is but a matter of winning the attention of clayworkers and architects.

In terra cotta or clay products the blocks have been made in various lengths, from 2-ft. lengths upwards, and are provided with slots or cuts in their ends, which enable them to be interlaced, so as to form a compact whole. Nor is it the intention of Mr. Van Wie to limit these blocks to clay constructive work. They are adapted also for the manufacture of iron or steel bridges, and several prominent engineers have written testimonials of their appreciation of the Van Wie locking device, in terms exceedingly gratifying to the inventor.

By the adjustment of the slotted and solid ends of these blocks, any form of construction may be obtained, from the most simple to the most intricate, from an ordinary barn to a mansion or a cathedral.



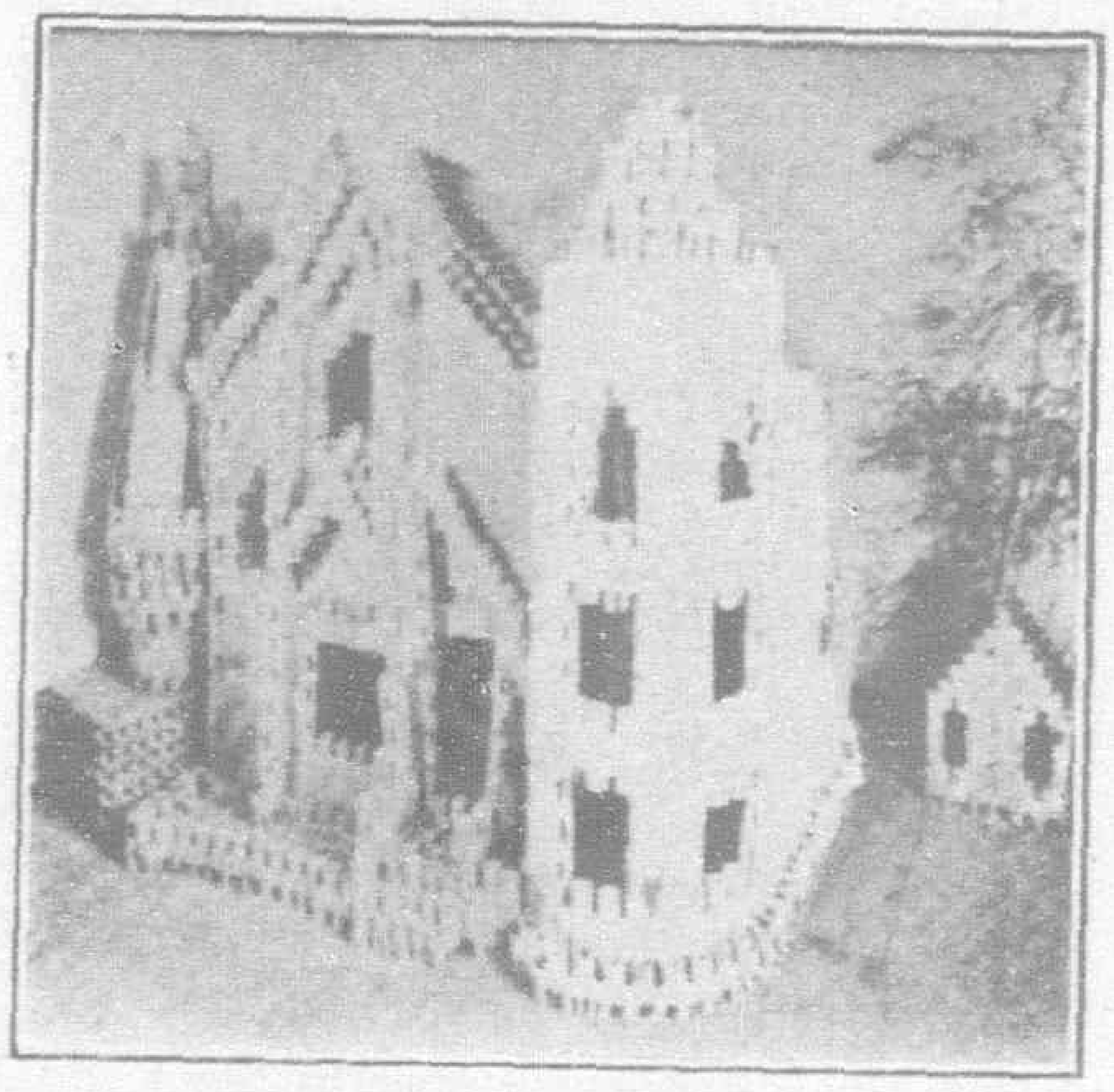
VAN WIE INTERLOCKING STRUCTURAL BLOCKS.



BIRCHWOOD BLOCK ARCHITECTURE.

The blocks have a thickness of about ⅝ in., the end slots being about three inches deep. Tests made on the strength of this interlocking system, when placed in position, reveal a sustaining value of over 7 tons to the sq. ft.

For tunneling purposes they are considered to be specially valuable, inasmuch as the tunnel walls can be built as the work progresses, guarding the workmen in a very efficient manner from possible cave-ins.



BIRCHWOOD BLOCK ARCHITECTURE.

The chief point of merit, however, claimed for this system is that the mode of adjustment of the blocks provides for their placing in position with the minimum of labor, securing the greatest possible factor of strength, and reducing the cost of the finished work by over thirty per cent.

The Far Eastern agent of the Van Wie material is Mr. G. W. Cooke, Engineer, of 31 Plaza Moraga, Manila, at whose offices samples of the blocks in wood and clay are on exhibition.

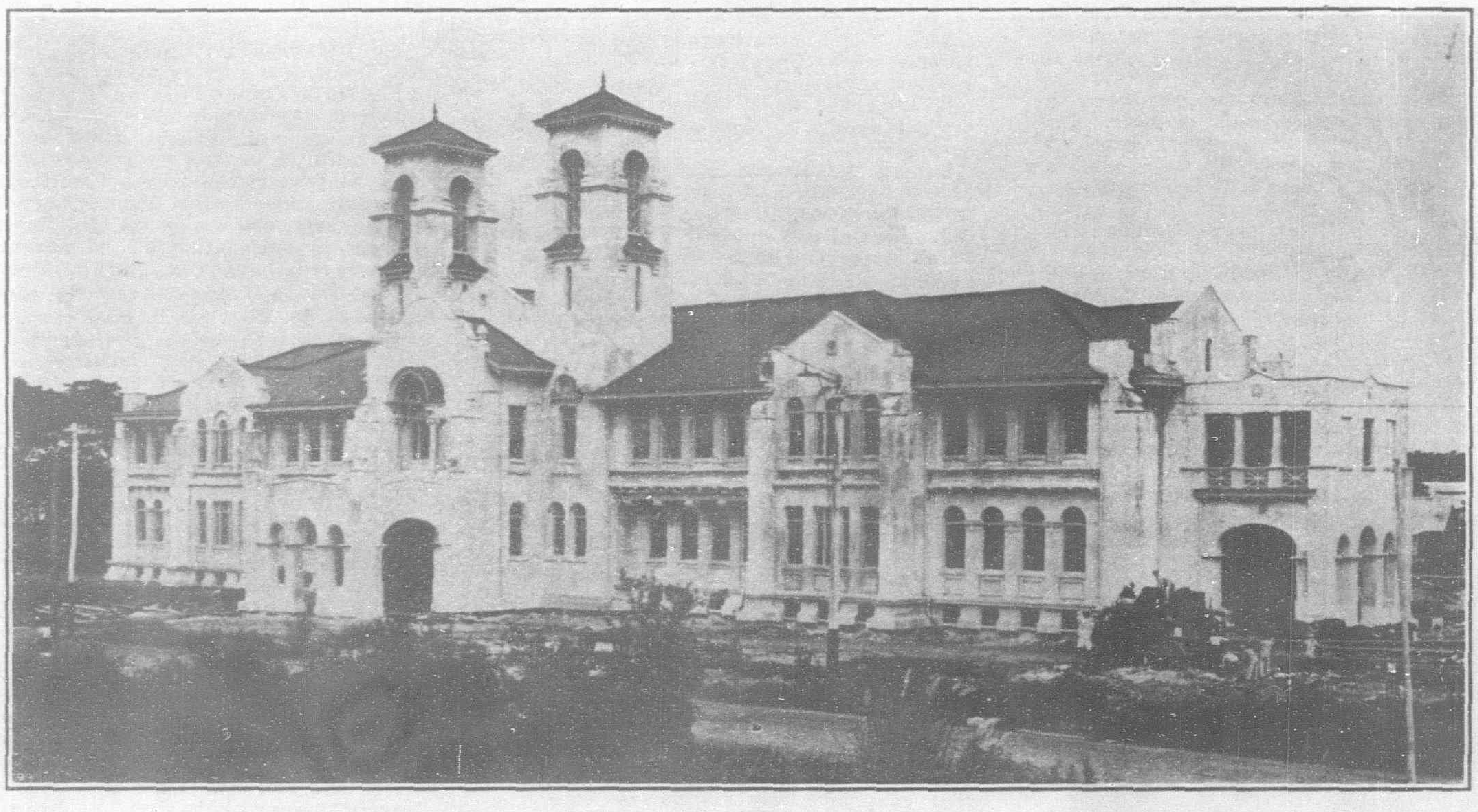
DISTINGUISHED PARTY WITH TAFT.

Secretary of War Taft has announced the personnel of the party of distinguished Americans who will accompany him on his trip to the Philippines this summer. The party will sail from the homeland in July, which will bring it to Manila some time in August. This party, besides the capitalists and railroad managers who are coming with Mr. Taft, will comprise at least five United States Senators and a full score of Representatives, whose motive in coming to the Philippines is actuated by a sincere desire to see the Philippines and come in personal contact with their people so as to be better able to legislate intelligently for these possessions along the lines of their greatest needs. Former Secretary of War Elihu Root has also announced his intention of visiting the Islands simultaneously with the Taft party, but whether he will come with the others or make the voyage *via* the Suez Canal, is not yet decided. The following gentlemen constitute the Senatorial party of the Secretary of War's fellow-junketers: Henry Cabot Lodge, the senior Senator from Massachusetts, mouthpiece of the administration on the floor of the upper house, a close personal friend of President Roosevelt, and chairman of the Senate committee on Philippine affairs; Charles A. Culberson, Senator from Texas, who recently distinguished himself by his opposition to the Philippine bill, especially the sections authorizing bond issues by the Philippine Government; Chester I. Long, Senator from Kansas; Francis E. Warren, Senator from Wyoming, Murphy J. Foster, Senator from Louisiana, who will look over the sugar industries of the Islands and the possibility of their rivaling the Louisiana sugar interests.

Joseph G. Cannon, the venerable Speaker of the House of Representatives, who has represented the State of Illinois in Congress for more than thirty years, will head the delegation from the House of Representatives, which will further include Congressman Sereno E. Payne who has represented the 31st District of the State of New York for twenty-three years, and is Chairman of the House Ways and Means Committee, which only the other day reported favorably on the Curtis Bill, contemplating virtual free trade for the Philippines with the United States; John Sharp Williams, Representative from Mississippi, the brilliant orator who presided over the deliberations of the Democratic National Convention at St. Louis last June; John Dalzell, from the 13th District of Pennsylvania, who has seen eighteen years' consecutive service on the floor of the House; Henry A. Cooper of Wisconsin, the father of the "Cooper bill" and Chairman of the House Committee on Insular Affairs and a most consistent friend of the Philippine Islands since their debut in American politics; Edgar D. Crumpacker of Indiana; James A. Tawney of Minnesota; George Edmund Foss of Illinois; James T. McCleary, another representative of Minnesota; Charles J. Grosvenor of Ohio, one of the most astute politicians on the floor of the House; Henry S. Boutell of Chicago, a Representative of Illinois whose voice has often been raised eloquently in debate on affairs before the House; James E. Watson of Indiana; Charles Curtis of Kansas, the father of the "Curtis Bill" for the reduction of the tariff on Philippine products imported into the United States; Bourke Cochran, the silver-tongued Democrat from New York; Champ Clark from Missouri; George R. Patterson of Pennsylvania; David A. De Armond, another Missourian who has been figuring prominently in many ways during the 58th Congress; Swager Sherley of Kentucky; James N. Gillett of California; Ebenezer J. Hill of Connecticut; and William A. Jones of Virginia.

HONGKONG ENGINEERS AND SHIP-BUILDERS

At the fourteenth annual general meeting of the members of the Institution of Engineers and Shipbuilders of Hongkong, held in that city recently, Mr. H. T. Richardson presided, and there were also present Messrs. J. D. Logan, T. W. Robertson, J. Lambert, E. O. Murphy, J. F. Miller, C. F. Focken, Rutter, R. Mitchell, A. Maclachlan, Murchie, and others. Officers for the present year were elected as follows: President, Mr. Newman Mumford; vice-Presidents, Mr. J Lambert and Mr. H. Richardson; Honorary Treasurer, Mr. T. W. Robertson; Honorary Secretary, Mr. C. Cooke. The Executive Committee for the ensuing year consists of Messrs. E. O. Murphy, W. A. Crake, J. Maclachlan, J. D. Morrison, J. W. Anderson, C. Templeman, J. H. Maclaren, W. J. Hill, W. H. Hutchison, J. McDougall, E. Watson, and J. Eadie.



MAIN BUILDING OF NEW GOVERNMENT LABORATORY, MANILA, P. I., RECENTLY OPENED.

RECONSTRUCTION OF SINGAPORE DOCKS AND WHARVES

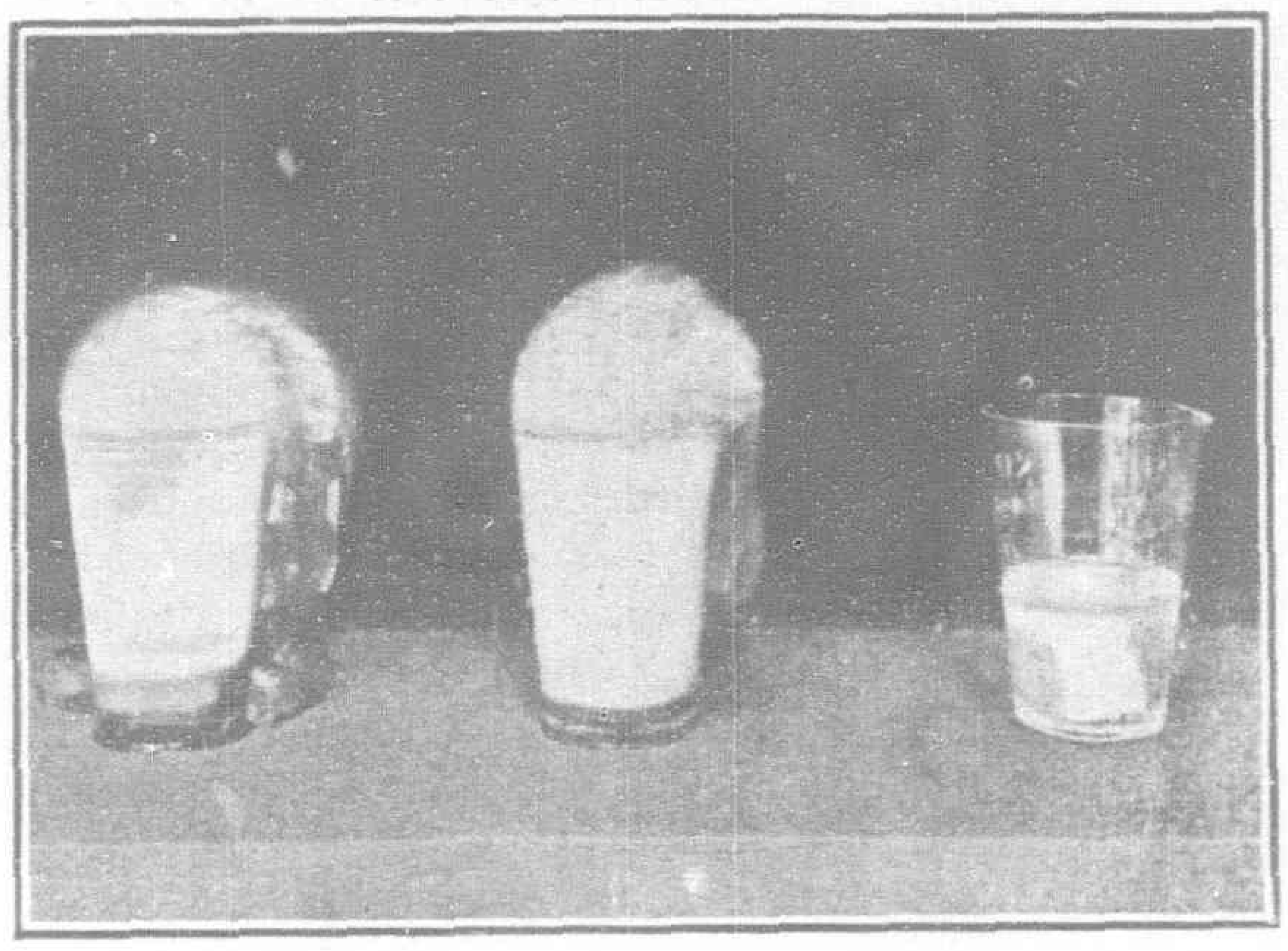
(Continued from page 18.)

79. The construction of a large graving dock, the best site for which, in our opinion, we have indicated on the plan, will no doubt come on for consideration, when the more pressing needs of improved cargo and coaling facilities have been provided for. A dock of this character will entail a very large additional outlay, and in view of the magnitude of the works which we have herein recommended for adoption, we have not thought it necessary to do more than to allude to this further undertaking in general terms.

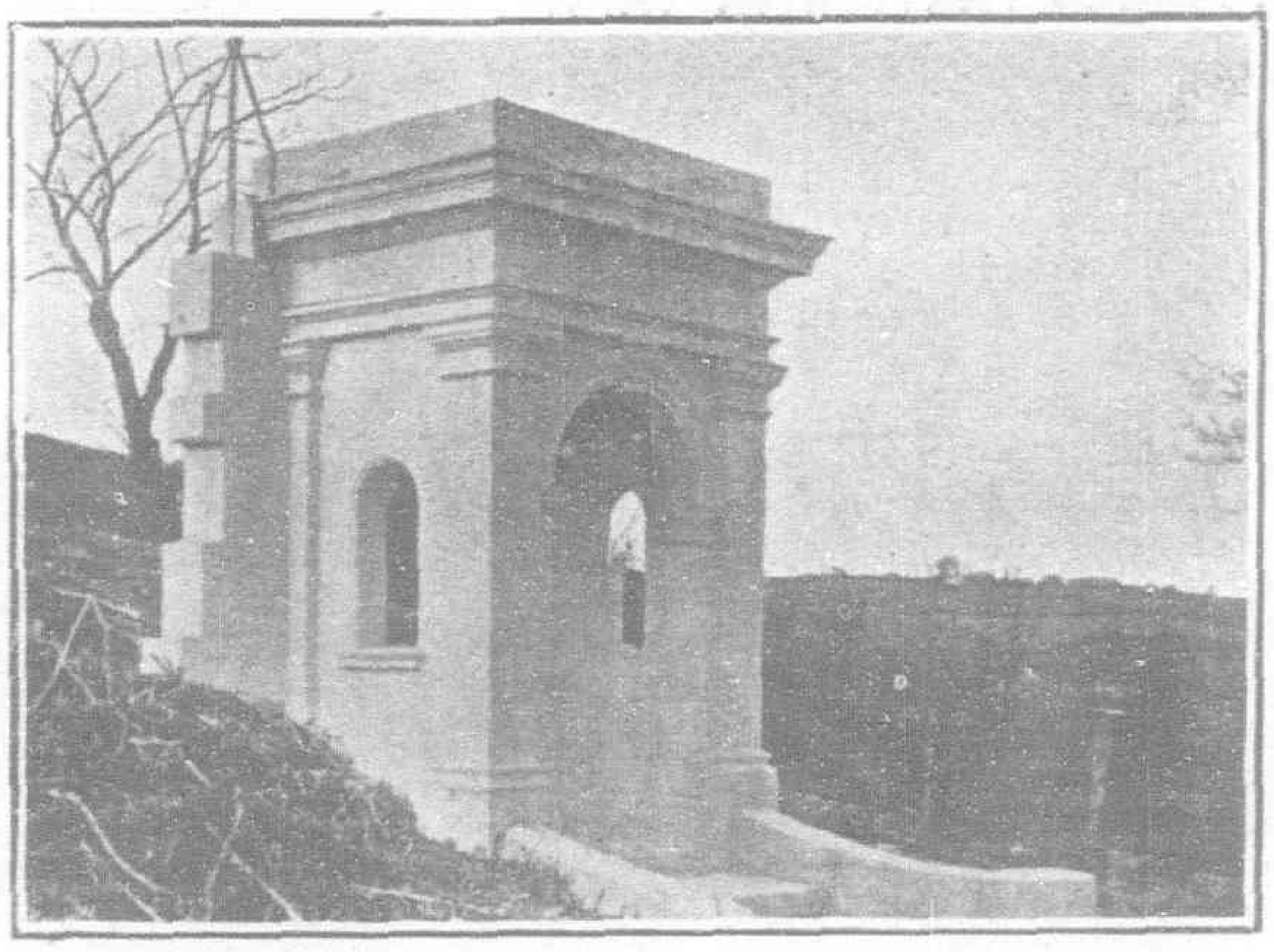
80. Summarizing our recommendations, we may observe that we put forward, with the fullest confidence, the proposal to initiate the improved accommodation at Tanjong Pagar, by the construction of the wet dock. The expenditure required on this work, viz., £790,000, would be distributed over a period of five years from the commencement of the undertaking, or, say, six years from this date, provided an early decision is arrived at to proceed with the work.

81. On the completion of the wet dock, the reconstruction of the Main wharf should be put in hand. This work would occupy a further period of about ten years, the expenditure thereon, viz., £740,000, being distributed over the same.

82. It will be seen from the foregoing, that the total expenditure of £1,530,000, would thus be distributed over a period of fifteen years from the date of the commencement of the wet dock. This period cannot well be shortened, as it is impracticable to proceed with the renewal of the Main wharf, until the wet dock has been completed, and the additional quay space, thereby made available, opened up for traffic.—COODE, SON & MATTHEWS. J. R. NICHOLSON.



PORTLAND STONE. BATH STONE. SILICATE-OF-LIME STONE.



PORCH MADE OF SILICATE-OF-LIME STONE.

SILICATE-OF-LIME STONE

Silicate-of-lime stone is a wonderful new industry which it is believed will work a revolution in the building trades. This stone has only about 8 per cent of lime, and then mostly combined with the 92 per cent of silica or sand, which is the only other ingredient of the artificial article being brought into combination under great heat and pressure. This stone is not another of the many concretes, cast into moulds, and generally called artificial stones; but it is a chemically combined stone owing its density and strength to the expansive power of the quicklime used, when resisted by external means.

The endeavor to produce this stone in bulk (to be cut up and used exactly like large blocks of natural stone), and commercially, dates from 1834; but neither in Germany nor England, where the efforts were made, were they successful until Mr. L. P. Ford, of Gresford, Eng., was, by a curious combination of circumstances, led to take up the question in connection with a silica mine which fell into his hands.

SILICATE-OF-LIME STONE, CARVED.

The stone withstands acids better than any of the building stones generally used; to crush it requires about 690 tons to the square foot; it resists salt water and carves well. According to the quantity of oxide of iron naturally present in most sands, or the amount added, the stone varies in color, most beautiful shades being obtainable.

Mr. Ford has also very greatly improved upon the making of silicate-of-lime bricks, otherwise called sand-lime bricks or stone bricks, so largely manufactured in Europe, and now being produced in the United States. The main differences are the absolutely crystallized product and great strength; as compared with the hitherto friable and bad-edged products of others. These improvements are due to important variations of the known processes, which are, of course, being patented, and cannot, therefore, be published yet; but the product is being widely distributed and highly commended.

Reports by Messrs. Stanger and Blount, Messrs. Kirkaldy and Son, Professor Hiorns (of Birmingham), Professor Woolson (of the Columbia University of New York), the United States Army Ordnance Department, Watertown, Mass., many builders and stonemasons—as, also, very numerous and extensive press notices—all testify to the high appreciation the new industry is receiving.

Mr. G. W. Cooke, Engineer, of 31 Plaza Moraga, Manila, is the Far Eastern agent of the Silicate-of-Lime Stone, Limited, and is prepared to show samples of his stone as well as to furnish estimates and all other information in connection with the same that might be sought for.

PROTECTORATE OF KIAO-CHOW

A report on the development of the Protectorate of Kiao-Chow, China, during the first nine months of 1904, has been laid before the Reichstag. It states that during the year decided progress was made in the establishment of ways of communication both by sea and by land. The first portion of the great harbor at Singtau was opened to shipping, and the German Shantung Railway was completed and thrown open for traffic. The report goes on to say that private enterprise in building and the laying down of industrial plant continues to increase, and it is mentioned that the first German daily paper in the Protectorate is now being printed in the newly-established printing works. Intercourse with the Chinese authorities remains friendly, a fact which testifies to the confidence of the Chinese in the German policy in the Protectorate and to the favorable effect which the latter has had upon the whole province.

EXTENSIVE SURVEY OF SIAM

Mr. A. J. Irwin, Acting Director of the Royal Survey Department of Siam, has just issued an interesting report on the work of his bureau for the period of a year. Following is a condensation of the leading features of the report:

During the year under consideration the Cadastral Party, which, in conjunction with the Traverse Party, yearly carries out the bulk of the work performed by the Survey Department, devoted its whole time to the Province of Pachin. The Traverse Party finished off its work in the Province of Pachin and started operations in Nakawn Chai-si. The Check Survey of sub-divided lands in the concession of the Siam Canals, Land and Irrigation Company was continued, and the Sea Coast Party continued its work in measuring holdings taken up for firewood. In the three provinces, Pitsanulok, Nakawn Sritamarat, and Pa-yupp, survey work was continued, and some surveys were made of disputed properties on behalf of various courts of justice.

The Cadastral Party, under the direction of Mr. Irwin, was able to nearly complete the cultivated area of the Province of Pachin which remained unsurveyed. The cadastral survey is made on a scale of $\frac{1}{4000}$, which experience has shown to be the most convenient and practical basis for this class of work and one peculiarly suited to the Siamese unit of land measurement, one sen on the scale being represented by one centimetre, and consequently a square sen or rai by a square centimetre.

The result of work reached a total of 962,860 rai (= 595 sq. miles), an increase of 132,921 rai (= 82 sq. miles) over the previous year's out-turn. The area attested, contained in 36,030 holdings, was 771,077 rai (= 476 sq. miles), in extent, which fell short of the area attested the previous year by 28,952 rai (=18 sq. miles). The average size of the holdings was 28 rai, compared with Krung-kao for instance, where it is about 15.

The Traverse Party, whose duty it is to keep in advance of the Cadastral Party, started operations in Nakawn Chai-si. A detached party finished off the balance of the traverse work in Pachin, and a start was made of a resurvey of that part of the town of Bangkok lying to the west of the Menam. Mr. E. Wyon-Smith, superintendent, was in charge of the party. The out-turn of work reached the total of 1,429,133 rai or 883 sq. miles. This shows an increase for the season under review of 129,439 rai, or 80 sq. miles.

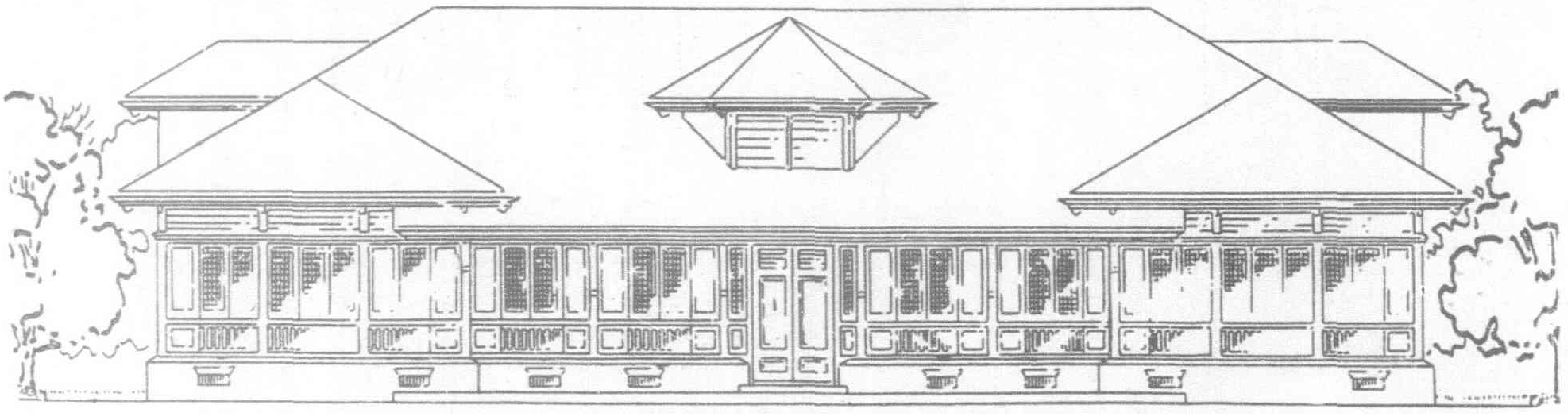
The total cost rate of the field work of the Traverse Party and the detail or field to field survey party, practically amounts to 12.01 atts per rai or 306 ticals (= £15 6s. 0d) per sq. mile. The previous year the cost rate was 339.5 ticals, or about £17 per sq. mile. There are signs that a considerable increase in coolie wages owing to the increased cost of living must be allowed for in the future, and this item alone will cause a substantial increase in the cost rates of all survey work in the Lower Menam Valley.

The Siam Canals, Land and Irrigation Company continued to sub-divide the land within its concession, and the check survey of the sub-division was made by Mr. Lindsay, and a small party of four sub-surveyors. The area measured amounted to 253,290 rai or 155 sq. miles, contained in 1,552 holdings or lots. To accomplish this work 46,094 sen or 1,152 linear miles and 1,506 angles had to be measured. The cost rate was 3.1 atts per rai or 78.4 ticals (= £3 18s. 4d.) per sqr. mile, a decrease of 6.6 ticals per sq. mile, compared with the cost rate for the previous season. The computations in connection with this survey are very heavy, as each holding has its boundaries and its area calculated mathematically. The district included in the operations of the Canal Company affords the only instance in Siam of survey before settlement.

SCHOOL BUILDINGS FOR PHILIPPINES

According to *The Philippine Teacher*, an educational journal published in Manila, Mr. R. J. Chard, the architectural draughtsman of the Bureau of Education, has been for some weeks engaged in the preparation of plans for primary, intermediate, and provincial high school plants. There is especial interest at present in the plans for intermediate schools, inasmuch as the bulk of school erection in the Philippines in the coming year will probably be buildings of this class.

The main intermediate school building has an iron roof, stone foundation, hard-wood frames, and shell sash. It is well supplied with ventilators. The cost is about -P- 12,000 in Manila, and will be found to be greater or, usually less in the provinces, dependent upon local prices of labor and material. All the rooms are on the ground floor, which is decidedly preferable for a school of this kind. It is designed for the housing of primary as well as intermediate classes, since the intermediate schools are expected to provide for primary students of their immediate vicinity as well as for the intermediate students of the neighboring municipalities. The intermediate class rooms are in the wings and the elementary rooms in the center of the building. The elementary rooms are separated by sliding partitions so that the entire center of the building may be converted into an assembly hall upon need.

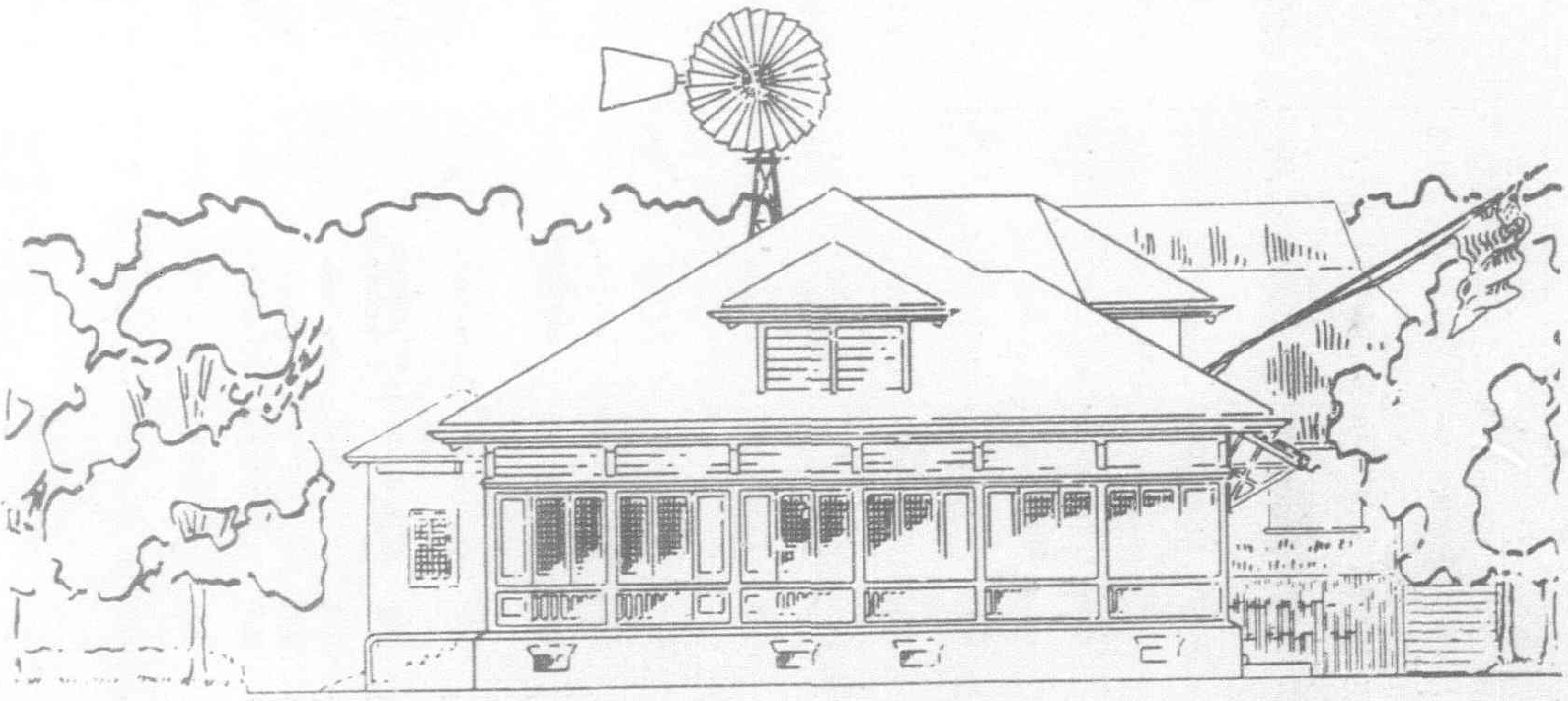


INTERMEDIATE SCHOOLS FOR PHILIPPINES—FRONT VIEW OF MAIN BUILDING.

A detailed plan for the treatment of the grounds has been drawn up by Mr. Chard. It is proposed to have the buildings surrounded by shade trees and shrubs, with flower beds at the sides and an ample play-ground in the rear. A list of desirable species of shrubs and shade trees is in preparation in the bureau with the cooperation of the Bureau of Agriculture and the Department of Parks of the city of Manila. In cases where these species are not obtainable locally, arrangements can be made for supplying planting material from Manila. The plan for treatment of grounds includes gravel walks which have been laid out with due regard for utility as well as symmetry.

It is the plan to have the wooden balustre between the foundation and the sliding sashes replaced as soon as possible by a wrought iron grill to be made by pupils in the workshop from designs which have been prepared. In fact it is expected that in the majority of cases it will be possible to erect the iron and woodworking shop almost as soon as the main building. Provision has already been made for the supply of specially trained teachers to take charge of the work in the intermediate schools. Under these conditions the shops will also contribute largely to the furniture of the school by making additional cabinets, tables, chairs, etc., which will not be so. A large order of tools for the equipment of some of these shops which have already been provided for is now being filled. When the school shops are well under way sashes, doors, and all interior finishings can be made by the pupils, and the cost of new buildings correspondingly reduced.

An 8x60 platform, 8 inches high, in front of the building, protected by the projection of the main roof will be found to make an attractive as well as a very useful additional feature.



INTERMEDIATE SCHOOLS FOR PHILIPPINES—SIDE VIEW OF MAIN BUILDING.

SHIPBUILDING IN THE FAR EAST

The *Glasgow Herald Shipbuilding and Engineering Annual* for the past year gives some very interesting information regarding the progress of Colonial shipbuilding in various parts of the British Empire. In the report of the Hongkong & Whampoa Dock Company there may be noticed a large steamer. This vessel is the largest yet built at the port, and a few years ago the company would have hesitated very much before attempting such a contract. But now it can take such orders and can compete with other builders in many parts of the world, in spite of the fact that all materials have to be imported. The vessel referred to is the *Kin Ling*, which is of 3700 tons register and 1600 I. H. P.

During the past year Tanjong Pagar Dock Company built no fewer than 20 vessels, the totals given being 1516 tons and 754 I. H. P. The Hongkong Docks built 14 during the same period of time, including the *Kin Ling* above referred to. George Fenwick & Co., Hongkong, built two vessels, one a steel lighter and the other a launch, but a period of greater activity for them in the matter of the building of ships may be safely prophesied since their acquirement of the new yard at Bay View.

Messrs. Riley, Hargreaves & Co., Ltd., Singapore, are reported as having built seven vessels during 1904—four teak launches, the *Despatch*, the *Hygeia*, and two other teak launches, the figures being given as 225 tons register and the I. H. P. at 690.

The marine engines turned out by colonial firms do not compare very favorably with those turned out in the previous year. Tanjong Pagar has 754 against 1430; Messrs. Riley, Hargreaves & Co., 600 against 1655; the Singapore Slipway Company, nil as against 300; Messrs. Fenwick & Co., 85 as against 100; the Hongkong Dock, 4,159 against 4,050.

In the current year Messrs. Riley, Hargreaves & Co. are building a steamer of 69 tons and 140 I. H. P., four teak launches aggregating 160 tons and 300 I. H. P., a vessel of 121 tons and 300 I. H. P., and a teak cargo steamer of 120 tons and 260 I. H. P. Messrs. Fenwick & Co. have two sets of engines in hand.

FAR EASTERN STOCKS AND QUOTATIONS

Courtesy of Benjamin, Kelly & Potts, Sharebrokers, Hongkong-Manila, 10th March, 1905.

STOCKS	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
											PER CENT	
Banks.												
Hongkong and Shanghai Banking Corporation	1865	$10,000,000	80,000	$125	$125	*g* £1,000,000 *s* $8,000,000 *i* $250,000	... $1,493,408	31-12-04	£1.10s. and bonus £1 @ exchange 1s. 11 9-16=$25.46 for second half-year 1904	20-2-05	5¾	$740 sales London £77½
National Bank of China, Limited	1891	£699,475	99,925	£7	£7	$175,533 *c* $191,973	........$21,668	31-12-03	$2 (London 3s. 6) for 1903	1-2-04	5¼	$36 buyers
Marine Insurances.												
Canton Insurance Office, Limited	1881	$2,500,000	10,000	$250	$50	$1,400,000 *j* $81,739	...... $150,494	31-12-03	$17 for 1903	22-10-04	6½	$280 buyers
China Traders' Insurance Co., Ld.	1865	$2,000,000	24,000	$83.33	$25	$950,000 *f* $151,992 *j* $362,366 *u* $371,445	.... Nil.	30-4-04	$4½ for year ended 30-4-1904	8-12-04	7½	$58½ sales
North China Insurance Co., Ld.	1863	£150,000	10,000	£15	£5	T800,000	...... T217,119	30-6-04	Final of 10s. making £1 for 1903	26-10-04	8	T95
Union Insurance Society of Canton, Limited	1867	$2,500,000	10,000	$250	$100	*s* $1,850,000 *g* £20,000 *f* $372,749 *j* $893,110 *u* $846,773	.....$2,078,997	30-6-04	$35 for 1903	21-10-04	5	$695 sellers
Yangtsze Insurance Association, Ld.	1862	$800,000	8,000	$100	$60	$700,000 *f* $37,794	...... $432,475	31-12-03	$12 for 1902	22-4-04	7½	$160
Fire Insurances.												
China Fire Insurance Co., Ld.	1870	$2,000,000	20,000	$100	$20	$1,000,000 *x* $125,675 *f* $2,561	...... $260,374	31-12-04	$6 dividend and $1 bonus for 1903	10 3-05	8¼	$86 ex div.
Hongkong Fire Insurance Co., Ld.	1868	$2,000,000	8,000	$250	$50	$1,200,505	...... $360,372	31-12-04	$34 for 1903	7-3-05	10½	$320 ex div.
Shipping, Tug and Cargo Boats.												
China and Manila Steamship Co., Ld.	1882	$750,000	(*1*) 30,000	$25	$25	none	*Dr.* $63,123	31-12-03	$5 for 1900	25-3-01	—	$21
Douglas Steamship Co., Ld.	1883	$1,000,000	20,000	$50	$50	$185,000 *i* $85,439	.... Nil.	30-6-04	$2 for year ended 30-6-1904	29-9-04	6	$34 sales
Hongkong, Canton and Macao Steamboat Company, Ld.	1865	$1,200,000	80,000	$15	$15	*e* $250,000 *d* $600,000 *f* $158,444	........$26,160	31-12-04	$1 for second half year 1904	15-2-05	10	$26½
Indo-China Steam Navigation Company, Ld.	1882	£1,200,000	(*2*) 60,000	£10	£10	£100,000 *i* £205,000	.... £5,853	31-12-03	10s. @ 1s. 10 5-16=$5.37.82 for 1903	13-7-04	4½	$122
Shanghai Tug and Lighter Co., Ld. Do. do. Preference	1903	T1,500,000	200,000 100,000	T50	T50	none	...... T55,541	31-12-03	Interim of T2 for 1904	13-8-04	9 7	T52 sales T50 sales
"Shell" Transport & Trading Co., Ld.	1898	£2,000,000	2,000,000	£1	£1	£400,000 *i* £4,116	...... £58,852	31-12-02	Interim of 1s. (Coupon No. 5) for '04	1-1-05	4½	22s.
"Star" Ferry Co., Ld.	1898 1900	$200,000	10,000 10,000	$10 $10	$10 $5	$60,000 *i* $15,093	.... $1,287	30-4-04	$1.80, Div. 40 cts. bonus for year ending 30-4-04. $0.90, " 20 " "	2-6-04	5½ 3½	$37½ sellers $29 sellers
Straits Steamship Co., Ld.	1890	$500,000	(*3*) 5,000	$100	$100	$400,000 *e* $21,075 *r* $18,000 *i* $130,153	.... $33,648	30 12-13	$5 for 2nd ½ year, making $13 for '03	21-4-04	10	$130 sellers
Taku Tug and Lighter Co., Ld.	—	T. T1,500,000	30,000	T. T50	T. T50	T102,000 *d* T212,614	.... T6,190	31-12-04	T1¾ final making T3¼ for 1904	29-2-05	10¾	T30
Refineries												
China Sugar Refining Company, Ld.	1878	$2,000,000	20,000	$100	$100	none	*Dr.* $147,717	31-12-03	Interim of $5 for 1904	29-8-04	—	$226 buyers
Luzon Sugar Refining Company, Ld.	1882	$700,000	7,000	$100	$100	none	*Dr.* $73,905	31-12-03	$3 for 1897	24-3-98	—	$25 buyers
Perak Sugar Cultivation Co., Ld.	—	T350,000	7,000	T50	T50	T100,000	.... T1,635	30-9-04	T2½ for year ending 30-9-04	17-12-04	4¾	T54 sales
Mining.												
Chinese Engin'ring and Mining Co., Ld.	1901	£1,000,000	1,000,000	£1	£1	*q* £40,000	.... £7,820	29-2-04	No. 3 of 1s 6d	15-9-04	—	T7.50 sales
Oriental Consolidated Mining Co., Ld.	1901	G.$5,000,000	*z* 500,000	G. $10	G. $10	none	G. $672,093	31-12-03	Final of 50 cents making G.$1 for '04	30-12-04	5¾	G. $17½ sales
Raub Australian Gold Mining Co., Ld.	1892	£200,000	150,000 50,000	£1 £1	18/10 £1	£4,873	*Dr.* £4,029	31-3-04	No. 12 of 1s.=48 cents	28-1-01	—	$4
Société Francaise des Charbonnages du Tonkin	1888	F.4,000,000	16,000	F.250	F.250	*l* F.307,740 *a* F.1,529,652	...... F.87,333	31-12-03	Final of F.25, making F. 50 for 1903.	1 9-04	—	$490

STOCKS	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation* PER CENT	CLOSING QUOTATIONS
Docks, Wharves and Godowns.												
Geo. Fenwick and Co., Ld.	1889	$150,000	6,000	$25	$25	$70,000	$10,517	31-12-03	$3.75 for 1903	11-3-04	9½	$40 buyers
Hongkong and Kowloon Wharf and Godown Co., Ld.	1886	$2,000,000	40,000	$50	$50	*q* $58,423 *i* $10,000 $250,000	$29,422	31-12-04	Final of $2½ making $5 for 1904	11-3-05	4¾	$103 ex div.
Hongkong & Whampoa Dock Co., Ld.	1901	$2,500,000	50,000	$50	$50	$33,500	$498,289	31-12-05	$6 div. & $1 bonus for 2nd ½ year '04	21-2-05	6¾	$207 sellers
Howarth Erskine, Ld.	1901	$1,200,000	12,000	$100	$100	$69,000	—	30-6-04	$10 div. & $5 bonus for the year	8-04	7½	$220
New Amoy Dock Co., Ld.	1892	$40,500	6,000	$6¾	$6¾	$55,500	$489	31-12-03	$1¼ for '03	5-5-04	5	$25 sellers
Riley Hargreaves & Co., Ld.	1899	$875,000	6,000	$100	$100	$150,000	$40,936	31-12-03	$10 div. and $2½ bonus for '03	7-3-04	6¼	$200 buyers
Do. (Preference)			2,750						$7 dividend for '03		6¼	$110
S. C. Farnham, Boyd & Co., Ld.	1901	T5,520,000	55,200	T100	T100	T900,000	T48,153	30-4-04	Interim of T5 account '04-05	6-1-05	8	T143 buyers
Shanghai and Hongkew Wharf Co.	1902	T3,200,000	32,000	T100	T100	*b* T487,210 *r* T50,913	T22,895	31-12-03	Interim of T4 for '04	23-8-04	8½	T147 sales
Tanjong Pagar Dock Co., Ld.	1864	$3,700,000	37,000	$100	$100	$2,100,000	—	30-6-04	$6 for first half year '04	9-04	3½	$360 sales
Yangtsze Wharf and Godown Co., Ld.	1902	T250,000	2,500	T100	T100	*r* T6,000	T1,760	31-12-03	T18 for '03	31-3-04	9½	T190
Lands, Hotels and Buildings.												
Astor House Hotel Co., Ld. (Shanghai)	1901	$750,000	(*4*) 30,000	$25	$25	none	$9,989	30-6-04	$2½ for year ending 30-6-04	30-8-04	8¼	$32 sales
Astor House Hotel, Ld. (Tientsin)	—	T. T100,000	2,000	T. T50	T. T50	T41,000	T655	29-2-04	Interim of T4	29-10-04	6	T150 sellers
Hongkong Hotel Co., Ld.	1866	$600,000	12,000	$50	$50	$100,000 *r* $11,824 *m* $20,000	$11,668	30-6-04	$5 for first half-year '04	29-8-04	7¾	$141 buyers
Hongkong Land Investment and Agency Co., Ld.	1889	$5,000,000	50,000	$100	$100	*e* $250,000	$37,875	31-12-04	Final of $6 making $12 for '04	31-1-05	9	$127½ sales
Hotel des Colonies Co., Ld. (Shanghai)	1902	T225,000	9,000	T25	T25	*n* T13,986	T680	31-3-04	T.087½ for the year ending 31-3-04.	28-5-04	4½	T21 sales
Humphreys' Estate & Finance Co., Ld.	1887	$1,500,000	150,000	$10	$10	*i* $200,994 *e* $50,000	11,958	31-12-04	90 cents for '03	11-2-05	7¾	$12
Kowloon Land and Building Co., Ld.	1889	$300,000	6,000	$50	$30	none	$377	31-12-04	$3 for '04	31-1-05	8	$38 buyers
Shanghai Land Investment Co., Ld.	1901	T2,600,000	52,000	T50	T50	T828,813 *e* T170,000	T40,066	31-12-04	T3 final & T2 bonus making T8 for '04	16-2-05	7½	T116 sales
Tientsin Hotel des Colonies, Ld.	1903	T70,000	1,400	T50	T50	none	*Dr.* T2,123	30-4-04	Interim of T3½	23-9-03	—	T49 sellers
Tientsin Land Investment Co., Ld.	1902	T772,600	7,726	T100	T100	*i* T57,626	T725	31-12-04	T4 final making T7 for '04	29-2-05	5½	T127½
Wei-hai-wei Land and Building Co., Ld.	1899	T91,850	3,764	T25	T25	none	T 687	31-12-04	None	—	—	T12 buyers
West Point Building Co., Ld.	1889	$625,000	12,500	$50	$50	none	$1,247	31-12-04	Final of $1.70 making $3.20 for '04	31-1-05	5½	$55 buyers
Cotton Mills.												
Ewo Cotton Spinning and Weaving Co., Ld.	1895	T750,000	15,000	T50	T50	none	T11,655	31-10-03	T4 for year ended 31-10-03	22-12-03	16	T27½ buyers
Hongkong Cotton Spinning, Weaving and Dyeing Co., Ld.	1901	$1,250,000	125,000	$10	$10	none	$22,862	31-7-04	50 cents for year ended 31-7-04	12-9-04	3	$14½ buyers
International Cotton Manufacturing Co., Ld.	1895	T750,000	(*5*) 10,000	T75	T75	T50,000	T13,629	30-9-04	Interim of 3 % a/c 1898	30-4-98	—	T24
Laou-kung-mow Cotton Spinning & Weaving Co., Ld.	1895	T800,000	(*6*) 8,000	T100	T100	none	T15,500	31-12-03	Interim of 4% a/c 1898 on 6,000 shares	1-8-98	—	T32½
Soy Chee Cotton Spinning Co., Ld.	1895	T1,000,000	2,000	T500	T500	*l* T5,658	T26,389	31-12-03	4 % for 1897	2-2-98	—	T150
Cigar and Tobacco Cos.												
Alhambra, Limited	1898	$60,000	300	$200	$200	none	$799	30-6-04	$125 for year ending 30-6-1900	15-8-01	—	$100 buyers
Philippine Company, Limited	1904	$675,000	67,500	$10	$10	—	—	—	First year	—	—	$9½
Shanghai-Sumatra Tobacco Co., Ld.	1902	T600,000	(*7*) 30,000	T20	T20	T24,820 *v* T25,000	T1,297	31-10-04	Interim of T6 per share making altogether T9	8-3-05	13¾	T67 ex. div.
Miscellaneous.												
A. S. Watson & Co., Ld.	1886	$900,000	90,000	$10	$10	$250,000 *e* $25,000	$2,883	31-12-03	Interim of 50 cents for '04	25-11-04	8	$12½ buyers
Bell's Asbestos Eastern Agency, Ld.	1895	£5,377 10s	8,604	12s. 6	12s. 6	none	£161	31-12-03	6d. per share for '03	21-7-04	5	$5½
Campbell, Moore & Co., Ld.	1886	$12,000	1,200	$10	$10	$3,500	$596	31-12-03	$3 for 1903	2-4-04	7½	$40 sellers
Central Stores, Ld.	—	$91,845	6,000	$15	$12	$20,000	$1,253	31-12-03	Interim of $1.20 for '04	20-7-04	11¾	$21 sellers
Do. (Founders')			123						None	—	—	$100
Do. (New Issue)	1904	$360,000	24,000	$15	$7½	—	First	year	Preferential of 7% for '04	20-7-04	8½	$7½ sellers
China-Borneo Co., Ld.	1903	$720,000	(*8*) 60,000	$12	$12	none	Nil.	31-12-03	60 cents for 1903	21-3-04	4¾	$14½ sellers
China Flour Mill Co., Ld.	—	T200,000	4,000	T50	T50	T25,000	T1,942	31-12-03	T6 for 1903	23-3-04	8	T74sales
China Light and Power Co., Ld.	1901	$300,000	30,000	$10	$10	none	$3,739	29-2-04	None	—	—	$10
China Provident Loan and Mortgage Co., Ld.	1898	*p* $1,000,000	100,000	$10	$10	$80,000	$1,581	31-12-04	80 cents for 1904	18-1-05	9¼	$8¾ sales
Dairy Farm Company, Ld.	1896	$187,500	25,000	$7½	$6	—	—	31-7-04	$1¼ for year ending 31-7-03	20-11-03	—	$12 buyers

STOCKS	WHEN ESTAB-LISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	AT WORKING ACCOUNT	DATE	LAST DIVIDEND	WHEN PAID	Approximate Return at Present Quotation*	CLOSING QUOTATIONS
											PER CENT	
Miscellaneous.—Continued												
E. L. Mondon, Ld.	1902	T350,000	7,000	T50	T50	none	*Dr.* T152,318	31-12-03	T5 for 1902	2-5-03	—	T10 buyers
Fraser & Neave, Ld.	1898	$225,000	4,500	$50	$50	$169,116	$2,706	31-12-03	$5 dividend and $2½ bonus for '03	26-3-04	7½	$101
Green Island Cement Co., Ld.	1889	$1,000,000	100,000	$10	$10	$400,000	$95,054	31-12-04	$2 for 1904	27-2-05	7¾	$26 sales
Do (New issue)	1905	$500,000	50,000	10	$5	*y* $250,000						$16 sales
Hall & Holtz, Ld.	—	$420,000	(*9*) 21,000	$20	$20	$186,000	$13,104	29-2-04	Interim of $1	28-11-04	14	$22½ buyers
Hongkong and China Gas Co., Ld.	1864	£70,000	7,000	£10	£10	£23,109 *f* £3,000	£7,625	31-12-03	Final of 6 per cent and bonus of 1 per cent making 22s. for '03	25-5-04	7½	$160 buyers
Hongkong Electric Co., Ld.	1889 1899	$600,000	30,000 30,000	$10 $10	$10 $5	none	$1,747	30-4-04	$1.00 50 cents for year ending 30-4-04	18-7-04	6¾ 5½	$16 $10
Hongkong High-Level Tramways Co., Ld.	1887	$125,000	1,250	$100	$100	$50,000	$2,796	30-11-04	$15 for year ending 30-11-04	24-12-04	7½	$200 sales
Hongkong Ice Company, Ld.	1881	$125,000	5,000	$25	$25	*k* $60,000	$5,356	31-12-04	Final of $13 making $17 for 1904	14-2-05	7	$242 sellers
H'kong Rope Manufacturing Co., Ld.	1883	$500,000	10,000	$50	$50	$50,000	$8,395	31-12-03	$10 for 1903	8-2-04	6½	$155 sellers
Hongkong Steam Waterboat Co., Ld.	1900	$150,000	15,000	$10	$10	$2,500	$299	30-9-04	Final of 70 cents and 50 cents bonus, making $1.90 for the year	26-11-04	10½	$18½ sellers
Katz Brothers, Ld.	1896	$1,000,000	10,000	$100	$100	$375,000	—	31-12-03	$13 for 1903	...-3-04	9¾	$135 buyers
Lane, Crawford & Co., Ld. (Shanghai).	1903	$250,000	2,500	$100	$100	none	$21,582	29-2-04	Interim of $5	19-11-04	8½	$145
Maatschappij tot Mijn-, Bosch- en Landbouwexploitatie in Langkat	1902	G.2,500,000	25,000	G.100	G.100	T528,210 *i* T19,465	T35,849	31-10-04	Fourth quarterly dividend of T5 making in all T35 for 04	15-12-04	14	T257½ sales
Maynard & Co., Ld	1901	$34,000	3,400	$10	$10	none	$803	31-12-03	$2 for year ended 31-10-03	...-1-04	8	$25
S. Moutrie & Company, Limited	1899	$200 000	4,000	$50	$50	$5,000	$832	30-6-04	Final of $3 making $5 for year end. 30-6-04	28-12-04	9	$55 sales
Shanghai and Hongkong Dyeing and Cleaning Co., Ld.	1903	$60,000	1,200	$50	$50	none	*Dr.* $5,537	31-8-04	None	—	—	$50
Shanghai Gas Co., Ld.	1903	T800,000	16,000	T50	T50	*q* T125,000 T108,172	T8,011	31-12-04	T3½ final and T1½ bonus making T8½ for '04	8-3-05	8	T105 ex div.
Shanghai Horse Bazaar Co., Ld.	1904	T270,000	5,400	T50	T50	T45,000	T10,247	31-12-03	T5 for 1903	8-5-05	5¾	T88 sales
Shanghai Pulp and Paper Co., Ld.	—	T450,000	4,500	T100	T100	T25,000	T6,968	31-12-04	Final of T8 making T14 for '04	28-2-04	9¾	T147½
Shanghai Waterworks Co., Ld.	1881	£144,000	7,200	£20	£20	T140,000	T7,369	31-12-03	Interim of 15s. for '04	25-7-04	6	T430 sales
Singapore Dispensary, Ld.	1891	$30,000	600	$50	$50	$19,000	$800	31-7-03	$5 for year ended 31-7-03	11-11-03	6	$80
South China Morning Post, Ld.	1903	$150,000	6,000	$25	$25	none	*Dr.* $39,020	29-2-04	None	—	—	$22 sales
Steam Laundry Co., Ld.	1902	$75,000	5,000 10,000	$5 $5	$5 $3	none	$3,644	31-5-04	60 cents for year ended 31-5-04 First year	2-8-04 —	8½ —	$7 buyers $4½ buyers
Straits Ice Company, Ld.	1884	$200,000	2,000	$100	$100	$45,000	—	—	$7½ for second half year '03	...-2-04	10	$150 sales
Straits Trading Co., Ld.	1887	$2,500,000	250,000	$10	$10	$750,000	—	30-9-04	$1 dividend and 35 cents bonus for half year ended 31-9-04.	...-12-04	6¾	$41 sales
Tientsin Native City Waterworks Co., Ld.	1902	T294,100	2,941	T100	T100	none	T2,025	31-12-04	T2 for half year	9-4-04	—	T. T100
Tientsin Waterworks Co., Ld.	1901	T. T200,000	2,000	T. T100	T. T100	T15,259	T2,211	30-4-04	Final of T4 making T8 for '03/4	20-6-04	6¼	T. T130
United Asbestos Oriental Agency, Ld.	1896	$100,000	9,900	$10	$4	$20,000	$480	31-5-04	90 cents for year ended 31-5-04	6-8-04	9¼	$9½ buyers
Do. do. (Founders')			100	$10	$10				$29.70		16¾	$180 buyers
Watkins, Limited	1899	$100,000	10,000	$10	$10	*e* $4,802	$1,042	31-12-03	$1 for 1903	28-3-04	12	$8½ sellers
William Powell, Ld.	1901	$120,000	12,000	$10	$10	*e* $3,000	$588	30-6-04	Final of 70 cts. making $1.20 for 03/4	28-9-04	9¾	$12¼ sellers

LOANS AND DEBENTURES	AGENTS FOR THE LOAN	AMOUNT OF LOAN	PAR VALUE	OUT-STAND'G BONDS	WHEN PAYABLE.	CLOSING QUOTATIONS
Chinese Government, 7 per cent. Silver Loan 1886 E.	H. K. & S. Bk. Cor.	T767,200	T250	2022	Mar. 31st & Sept. 30th each year until Mar. 31st, 1917.	par. Plus accrued interest
Hongkong Hotel Co., Ld., 6% Mortgage Debentures of 1899‡		$500,000	$500	§ all	Half yearly, June 30th and December 31st	par.
Chinese Engineering & Mining Co., Ltd., 6 per cent Debentures of 1902†	The Company.	£500,000	¶	£490,000	Half yearly, January 1st and July 1st	par.

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a Amortisation Fund.
b Building Reserve Account.
c Capital Reserve Fund.
d Depreciation and Insurance Fund.
e Equalization of Dividend Fund.
f Exchange and Investment Fluctuation Account.
g Gold Reserve Fund
h Exchange Reserve Account.
i Insurance Fund.
j Reinsurance Fund.
Contingencies Account

l Legal Reserve Fund.
m Electric Light Installation Fund.
n Sinking Fund.
o
p Authorized capital $2,000,000.
q Depreciation and Repair Fund.
r Repairs and Renewals Account.
s Silver Reserve Fund.
t
u Underwriting Suspense Account.
v Special Works Fund.

w
x Extra Reserve Fund.
y Premium on New Issue.
z 75,000 owned by the Company.
1 5,725 shares unissued.
2 First issue of 60,000 of which 10,411 unallotted.
3 785 shares unissued.
4 7,600 shares unissued.
5 1,616 shares unallotted.
6 842 shares unallotted.
7 Only 13,000 shares issued.

8 14,000 shares unissued.
9 1,166 shares unissued.
* Based on last year's dividend.

§ 373 held by the Company.
¶ In certificates of £20 and £100
‡ Redeemable in 10 years, or at option of Company the Company giving 6 months' notice.
† Redeemable at par at rate of £10,000 per annum from 31st December, 1903, to 31st December, 1952.
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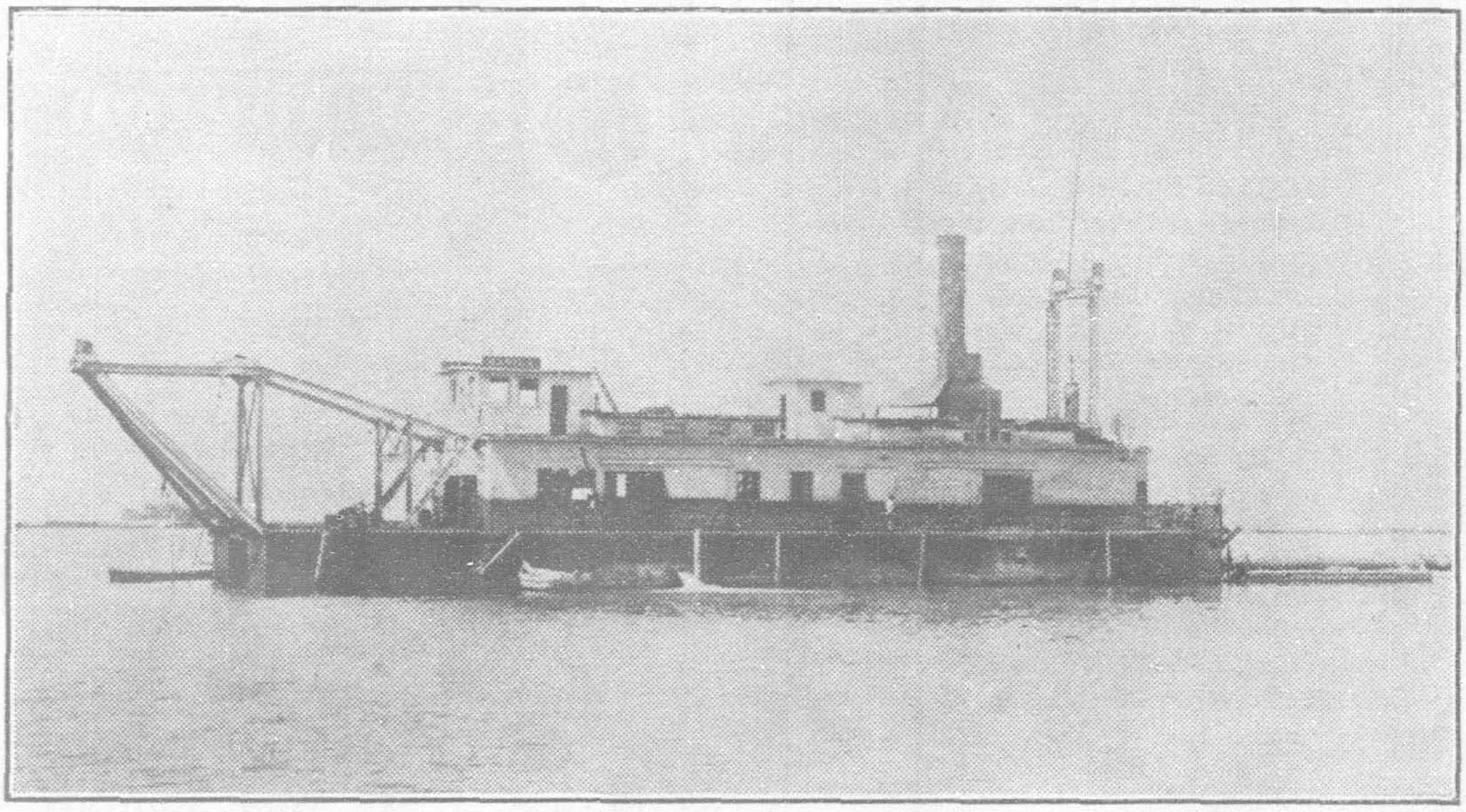

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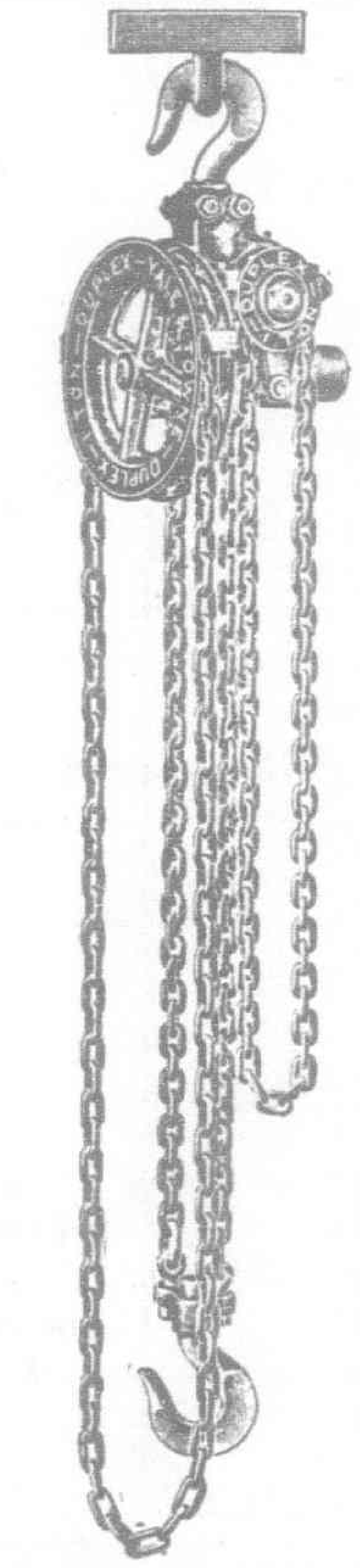

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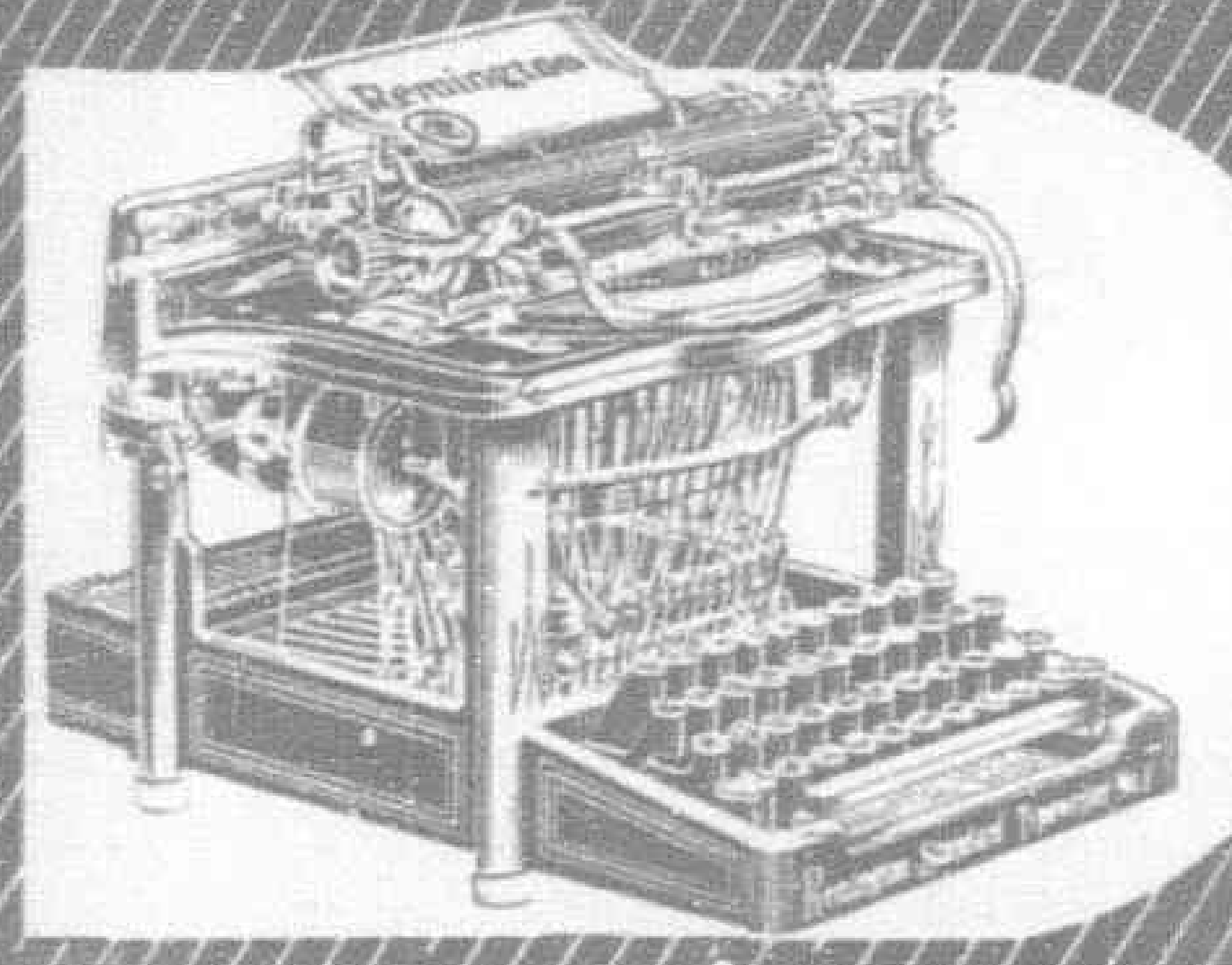

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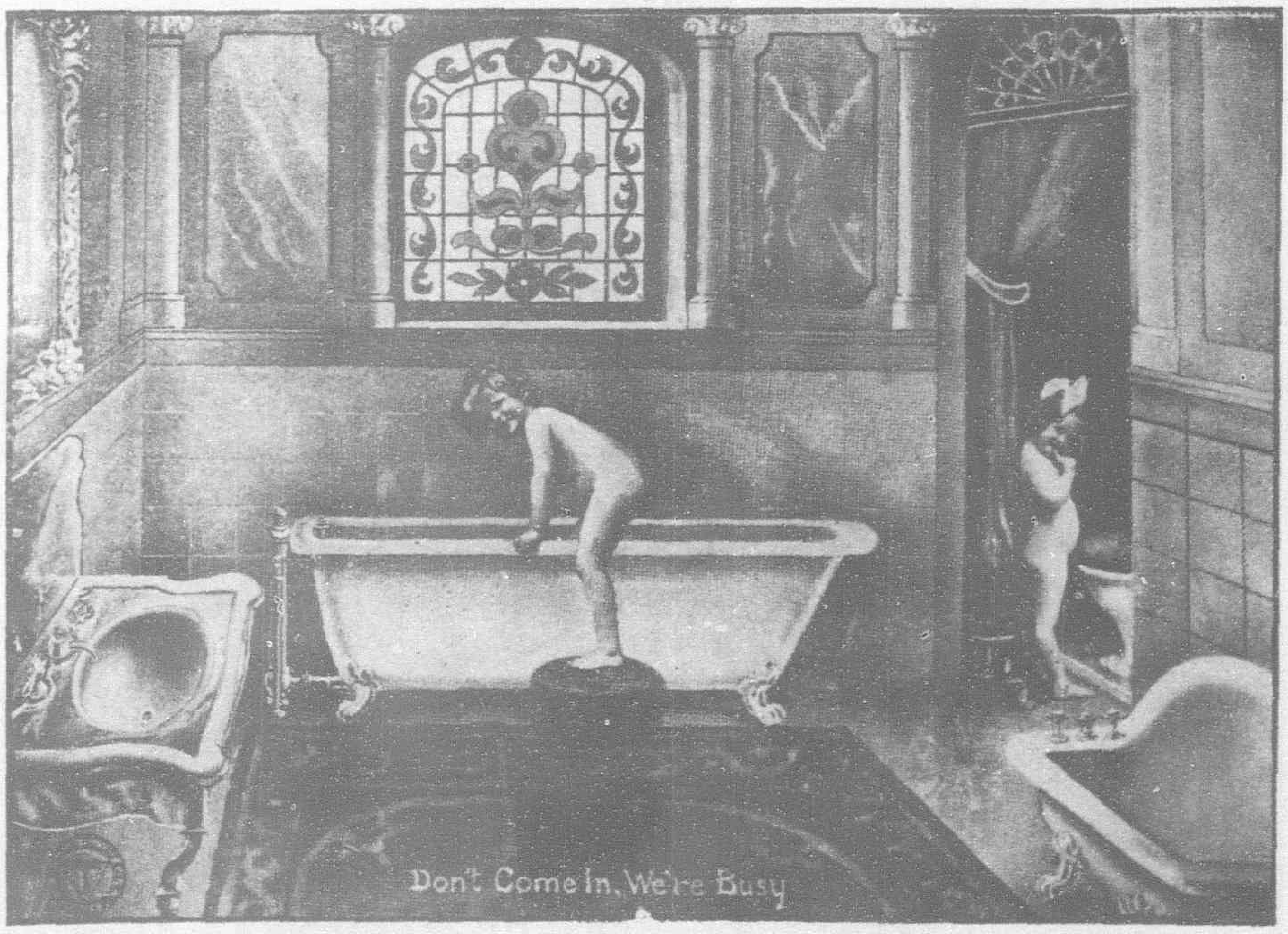
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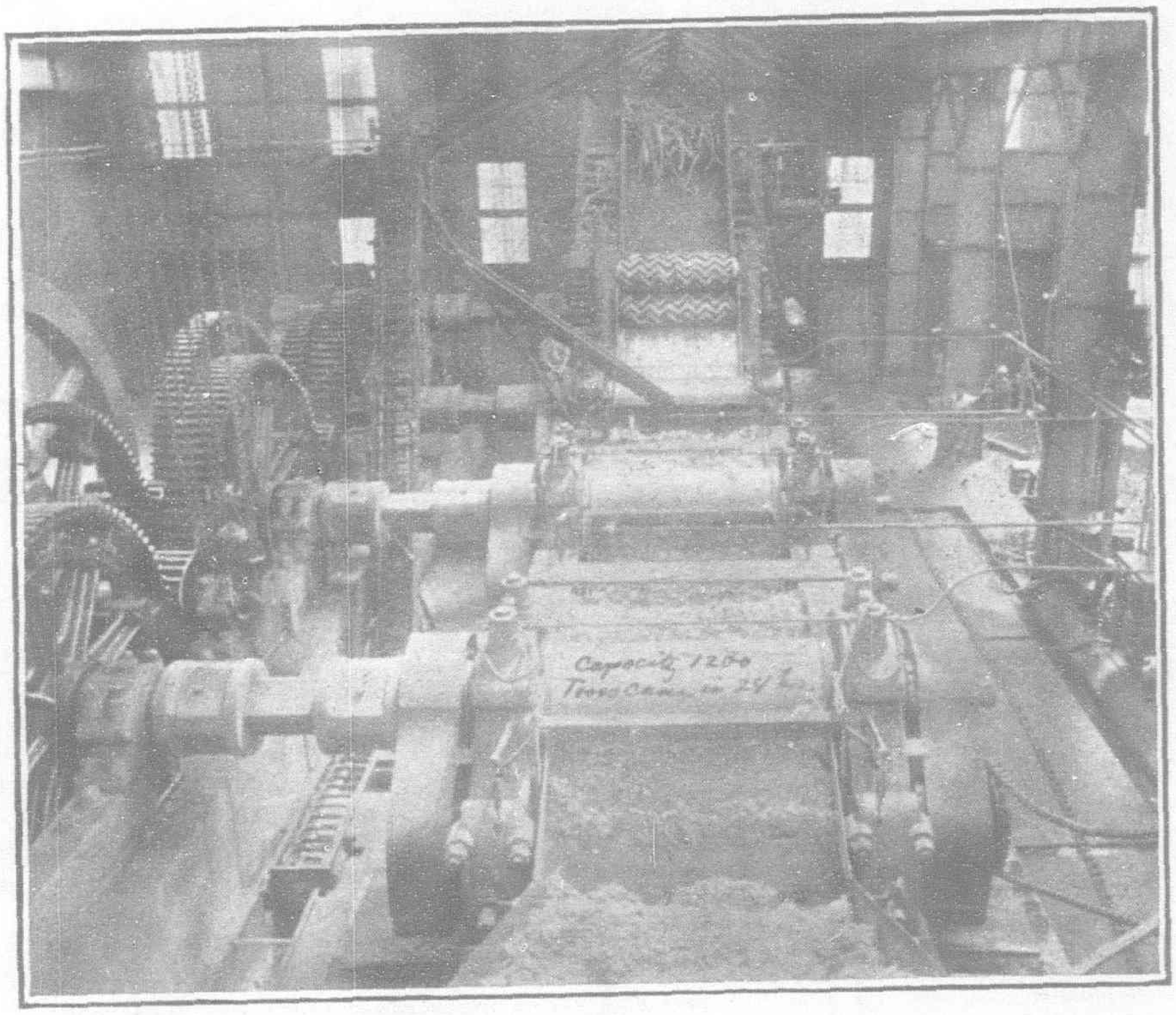

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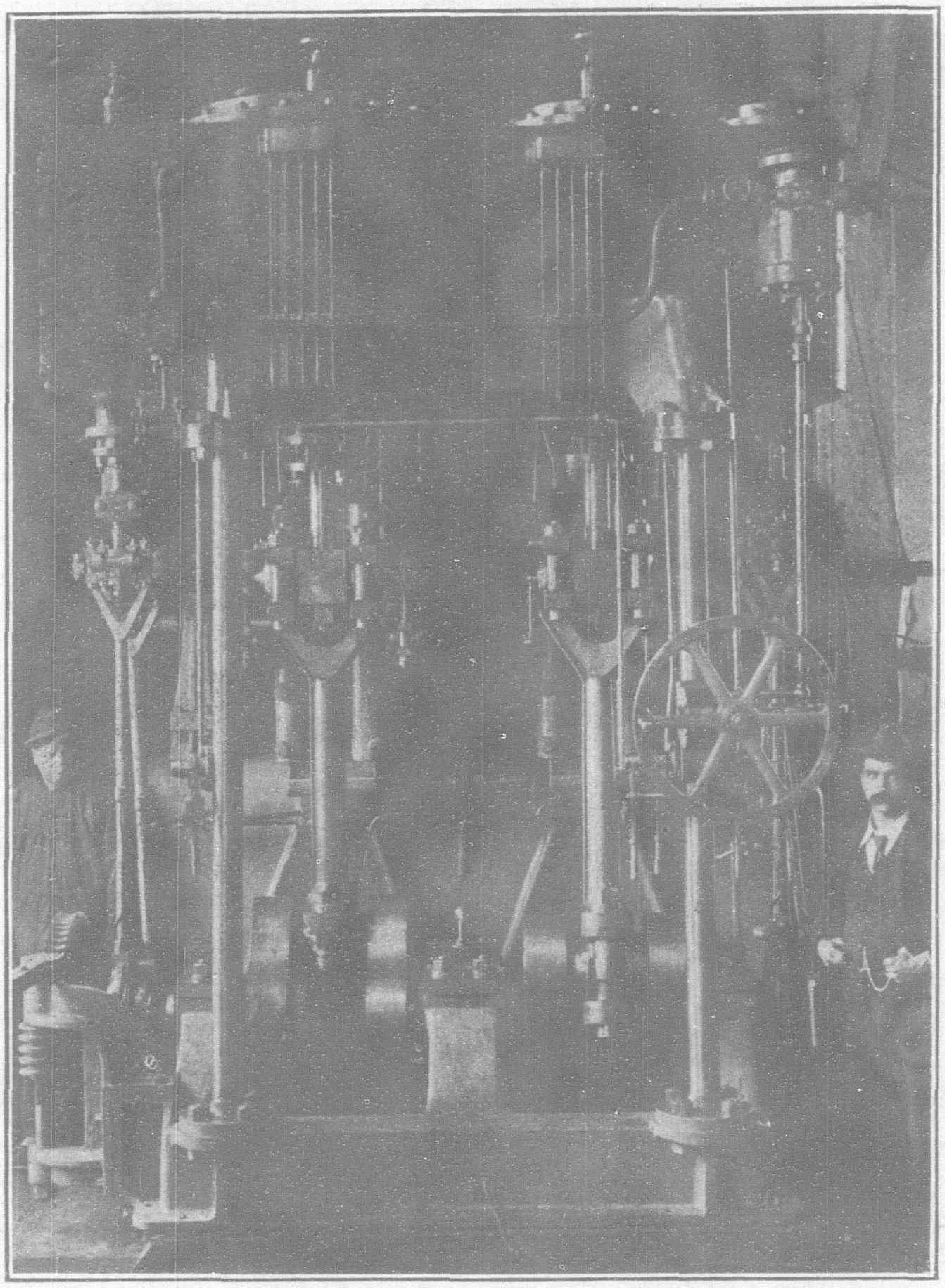

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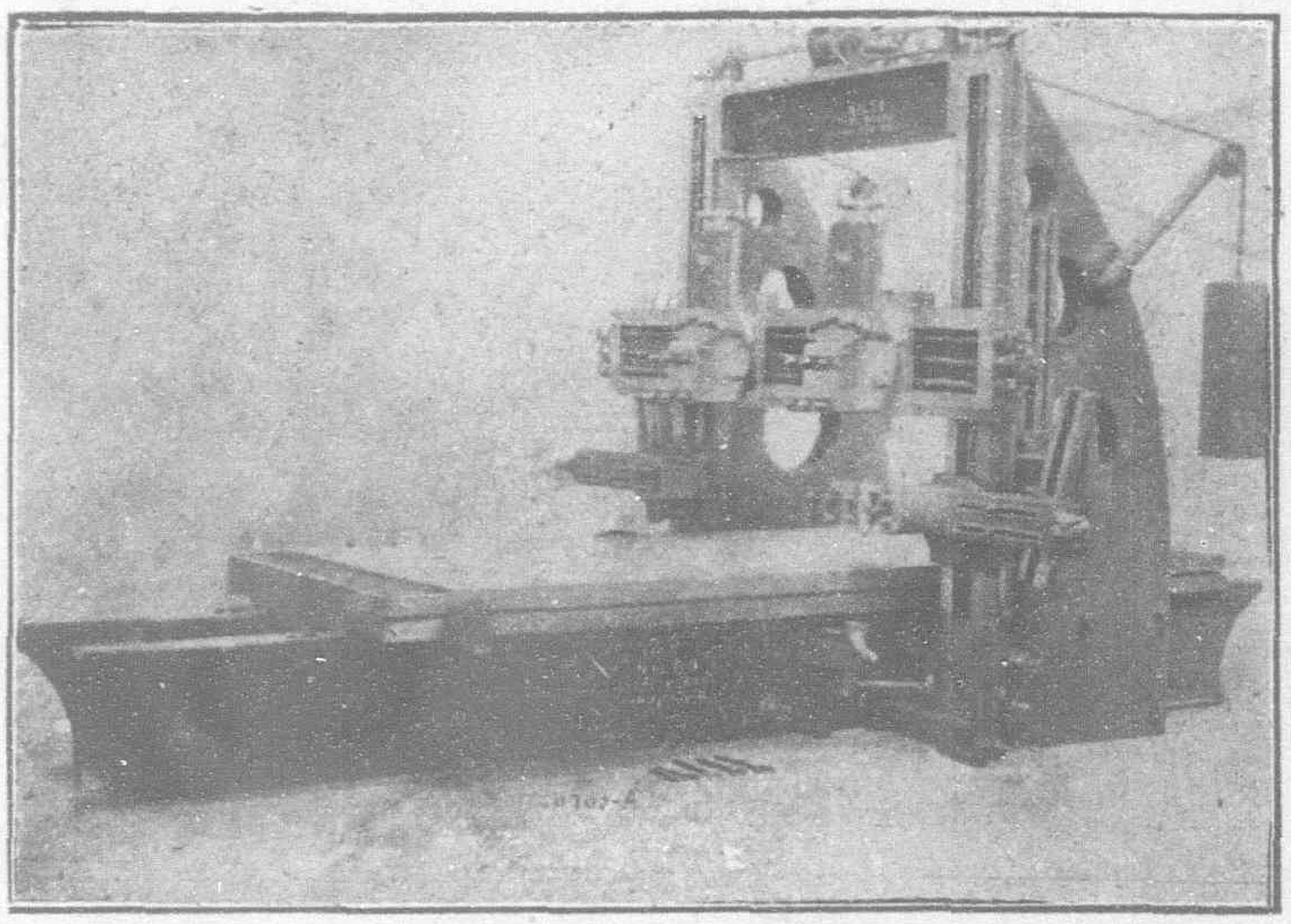

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